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=> file reg
FILE 'REGISTRY' ENTERED AT 13:19:57 ON 30 JAN 2004
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=> display history full l1-


     FILE 'REGISTRY' ENTERED AT 12:49:11 ON 30 JAN 2004
                    E NITROGEN TRIFLUORIDE/CN
L1                1 SEA "NITROGEN TRIFLUORIDE"/CN
                    E FLUORINE/CN
L2                1 SEA FLUORINE/CN
                    E HYDROGEN FLUORIDE/CN
L3                1 SEA "HYDROGEN FLUORIDE"/CN
                    E UREA/CN
L4                1 SEA UREA/CN

     FILE 'HCA' ENTERED AT 12:53:24 ON 30 JAN 2004
L5             4572 SEA L1 OR (NITROGEN# OR N)(W)(FLUORIDE# OR TRIFLUORIDE#)
                    OR NF3 OR F3N

     FILE 'LCA' ENTERED AT 12:53:28 ON 30 JAN 2004
L6              226 SEA L2 OR F2 OR (FLUORINE# OR F)(2A)(GAS## OR GASEOUS?
                    OR GASIF? OR ATM# OR ATMOS? OR APPLY? OR APPLIED OR
                    APPLICATION? OR INTRODUC? OR INJECT? OR SYRING? OR
                    NEEDL? OR NOZZL? OR JET OR JETS OR PORT OR PORTS OR
                    PORTAL? OR STREAM? OR FLOW OR FLOWS OR FLOWED OR
                    FLOWING# OR TREAT? OR PROCESS?)

     FILE 'HCA' ENTERED AT 12:59:46 ON 30 JAN 2004
L7            92046 SEA L2 OR F2 OR (FLUORINE# OR F)(2A)(GAS## OR GASEOUS?
                    OR GASIF? OR ATM# OR ATMOS? OR APPLY? OR APPLIED OR
                    APPLICATION? OR INTRODUC? OR INJECT? OR SYRING? OR
                    NEEDL? OR NOZZL? OR JET OR JETS OR PORT OR PORTS OR
                    PORTAL? OR STREAM? OR FLOW OR FLOWS OR FLOWED OR
                    FLOWING# OR TREAT? OR PROCESS?)
L8           119652 SEA L3 OR HYDROGEN#(W)FLUORIDE# OR HF
L9           196214 SEA L4 OR UREA#
L10             327 SEA L5 AND L7 AND L8
L11               6 SEA L10 AND L9
L12            3654 SEA L8(2A)(ANH# OR ANHYD? OR DRY? OR DRIED OR DESSICAT?
                    OR DESICAT? OR DESICCAT? OR DESSICCAT?)
L13              17 SEA L10 AND L12

     FILE 'LCA' ENTERED AT 13:08:24 ON 30 JAN 2004
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L14        32135 SEA (PRODUC? OR PROD# OR GENERAT? OR MANUF? OR MFR# OR
                 CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE# OR
                 MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR? OR
                 PREP#)/BI,AB

     FILE 'HCA' ENTERED AT 13:08:55 ON 30 JAN 2004
L15          887 SEA L14(3A)(L1 OR L5)
L16          240 SEA L1/P
L17           87 SEA L10 AND (L15 OR L16)
L18         3277 SEA L1
L19        41038 SEA L2
L20        35869 SEA L3
L21           74 SEA L17 AND L18
L22           60 SEA L17 AND L19
L23           59 SEA L17 AND L20
L24           15 SEA L13 NOT L11
L25           44 SEA L21 AND L22 AND L23
L26           43 SEA L25 NOT (L11 OR L24)
L27           31 SEA (L21 OR L22 OR L23) NOT (L11 OR L24 OR L26)
L28            6 SEA L17 NOT (L11 OR L24 OR L26 OR L27)
L29            6 SEA L11 AND (1907-2001/PRY OR 1907-2001/PY)
L30           15 SEA L24 AND (1907-2001/PRY OR 1907-2001/PY)
L31           42 SEA L26 AND (1907-2001/PRY OR 1907-2001/PY)
L32           26 SEA L27 AND (1907-2001/PRY OR 1907-2001/PY)
L33            6 SEA L28 AND (1907-2001/PRY OR 1907-2001/PY)
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FILE 'HCA' ENTERED AT 13:21:11 ON 30 JAN 2004

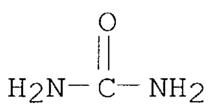
=> d l29 1-6 cbib abs hitstr hitind

L29 ANSWER 1 OF 6 HCA COPYRIGHT 2004 ACS on STN
138:139598 Method for manufacture of **nitrogen trifluoride**. Igumnov, S. M.; Kharitonov, V. P. (Zakrytoe Aktsionernoe Obshchestvo Nauchno-Proizvodstvennoe Ob'edinenie "PiM-Invest", Russia). Russ. RU 2184698 C1 20020710, No pp. given (Russian). CODEN: RUXXE7. APPLICATION: RU 2001-112703 20010508.

AB New method for the manuf. of **nitrogen trifluoride** suitable for use in semiconductor device fabrication is described. The method includes fluorination of carbamide or products of its decompn. by fluorine in anhyd. **hydrogen fluoride** at -20.degree.-0.degree. and fluorine to initial compds. molar ratio of .ltoreq.3. Concn. of initial compds. in anhyd. fluorine is 20-50

wt.%. The method is explosion-proof and allows to produce product
with max. content of **nitrogen trifluoride** and
minimal concn. of impurities with yield up to 90%.

IT **57-13-6,** Carbamide, processes **7664-39-3,**
Hydrogen fluoride, processes **7782-41-4,**
Fluorine, processes
(method for manuf. of **nitrogen trifluoride**
suitable for use i.m. semiconductor device fabrication)
RN 57-13-6 HCA
CN Urea (8CI, 9CI) (CA INDEX NAME)



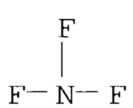
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7783-54-2P, Nitrogen trifluoride**
(method for manuf. of **nitrogen trifluoride**
suitable for use i.m. semiconductor device fabrication)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C01B021-083
CC 49-5 (Industrial Inorganic Chemicals)
Section cross-reference(s): 76
ST **nitrogen trifluoride** manuf
IT Semiconductor device fabrication
(method for manuf. of **nitrogen trifluoride**
suitable for use i.m. semiconductor device fabrication)
IT **57-13-6,** Carbamide, processes **7664-39-3,**
Hydrogen fluoride, processes **7782-41-4,**

Fluorine, processes
(method for manuf. of **nitrogen trifluoride**
suitable for use i.m. semiconductor device fabrication)
IT **7783-54-2P, Nitrogen trifluoride**
(method for manuf. of **nitrogen trifluoride**
suitable for use i.m. semiconductor device fabrication)

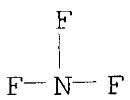
L29 ANSWER 2 OF 6 HCA COPYRIGHT 2004 ACS on STN
116:135528 Performance-oriented packaging standards; changes to classification, hazard communication, packaging and handling requirements based on UN standards and agency initiative. (United States Dept. of Transportation, Washington, DC, 20590-0001, USA). Federal Register, 55(246), 52402-729 (English) 21 Dec 1990. CODEN: FEREAC. ISSN: 0097-6326.
AB The hazardous materials regulations under the Federal Hazardous Materials Transportation Act are revised based on the United Nations recommendations on the transport of dangerous goods. The regulations cover the classification of materials, packaging requirements, and package marking, labeling, and shipping documentation, as well as transportation modes and handling, and incident reporting. Performance-oriented stds. are adopted for packaging for bulk and nonbulk transportation, and SI units of measurement generally replace US customary units. Hazardous material descriptions and proper shipping names are tabulated together with hazard class, identification nos., packing group, label required, special provisions, packaging authorizations, quantity limitations, and vessel stowage requirements.
IT **7664-39-3, Hydrogen fluoride,**
miscellaneous **7782-41-4**, Fluorine, miscellaneous
7783-54-2, Nitrogen trifluoride
(packaging and transport of, stds. for)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 59-6 (Air Pollution and Industrial Hygiene)
IT 1305-79-9, Calcium peroxide 1305-99-3, Calcium phosphide 1309-60-0, Lead dioxide 1310-58-3, Potassium hydroxide, miscellaneous 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, miscellaneous 1310-82-3, Rubidium hydroxide 1312-73-8, Potassium sulfide 1313-60-6, Sodium peroxide 1313-82-2, Sodium sulfide, miscellaneous 1314-18-7, Strontium peroxide 1314-22-3, Zinc peroxide 1314-24-5, Phosphorus trioxide 1314-34-7, Vanadium trioxide 1314-56-3, Phosphorus pentoxide, miscellaneous 1314-62-1, Vanadium pentoxide, miscellaneous 1314-80-3, Phosphorus sulfide (P2S5) 1314-84-7, Zinc phosphide 1314-85-8, Phosphorus sesquisulfide 1319-77-3, Cresylic acid 1320-37-2, Dichlorotetrafluoroethane 1321-10-4, Chlorocresol 1321-31-9, Phenetidine 1327-53-3, Arsenic trioxide 1330-20-7, Xylene, miscellaneous 1330-45-6, Chlorotrifluoroethane 1330-78-5, Tricresyl phosphate 1331-22-2, Methyl cyclohexanone 1332-12-3, Fulminating gold 1332-37-2, Iron oxide, properties 1333-39-7, Phenolsulfonic acid 1333-41-1, Picoline 1333-74-0, Hydrogen, miscellaneous 1333-82-0, Chromium trioxide 1333-83-1, Sodium **hydrogen fluoride** 1335-26-8, Magnesium peroxide 1335-31-5, Mercury oxycyanide 1335-85-9, Dinitro-o-cresol 1336-21-6, Ammonium hydroxide 1337-81-1 1338-23-4, Methyl ethyl ketone peroxide 1341-24-8, Chloroacetophenone 1341-49-7, Ammonium **hydrogen fluoride** 1344-40-7, Lead phosphite, dibasic 1344-67-8, Copper chloride 1498-40-4, Ethyl phosphonous dichloride 1498-51-7, Ethyl phosphorodichloridate 1569-69-3, Cyclohexyl mercaptan 1609-86-5, tert-Butyl isocyanate 1623-15-0 1623-24-1, Isopropyl acid phosphate 1634-04-4, Methyl-tert-butyl ether 1693-71-6, Triallyl borate 1705-60-8, 2,2-Di(4,4-di-tert-butylperoxycyclohexyl)propane 1712-64-7, Isopropyl nitrate 1719-53-5, Diethyldichlorosilane 1737-93-5, 3,5-Dichloro-2,4,6-trifluoropyridine 1789-58-8, Ethyldichlorosilane 1795-48-8, Isopropyl isocyanate 1838-59-1, Allyl formate 1873-29-6, Isobutyl isocyanate 1885-14-9, Phenylchloroformate 1947-27-9, Arsenic trichloride 2050-92-2, Di-n-amylamine 2094-98-6, 1,1'-Azodi(hexahydrobenzonitrile) 2144-45-8, Dibenzyl peroxydicarbonate 2155-71-7 2167-23-9, 2,2-Di(tert-butylperoxy)butane 2217-06-3, Dipicryl sulfide 2243-94-9, 1,3,5-Trinitronaphthalene 2244-21-5, Potassium dichloroisocyanurate 2294-47-5, p-Diazidobenzene 2312-76-7 2338-12-7, 5-Nitrobenzotriazole 2487-90-3, Trimethoxysilane

2508-19-2, Trinitrobenzenesulfonic acid 2524-03-0, Dimethyl chlorothiophosphate 2524-04-1, Diethylthiophosphoryl chloride 2549-51-1, Vinyl chloroacetate 2551-62-4, Sulfur hexafluoride 2567-83-1, Tetraethylammonium perchlorate 2657-00-3, Sodium 2-diazo-1-naphthol-5-sulfonate 2691-41-0, Cyclotetramethylenetetranitramine 2696-92-6, Nitrosyl chloride 2699-79-8, Sulfuryl fluoride 2782-57-2, Dichloroisocyanuric acid 2782-57-2D, Dichloroisocyanuric acid, salts 2820-51-1, Nicotine hydrochloride 2825-15-2 2855-13-2, Isophoronediamine 2867-47-2, Dimethylaminoethyl methacrylate 2893-78-9, Sodium dichloroisocyanurate 2937-50-0, Allyl chloroformate 2941-64-2, Ethyl chlorothioformate 2980-64-5 3025-88-5, 2,5-Dimethyl-2,5-dihydroperoxy hexane 3031-74-1, Ethyl hydroperoxide 3032-55-1 3054-95-3, 3,3-Diethoxypropene 3087-37-4, Tetrapropylorthotitanate 3129-90-6, Isothiocyanic acid 3129-91-7, Dicyclohexylammonium nitrite 3132-64-7, Epibromohydrin 3165-93-3, 4-Chloro-o-toluidine hydrochloride 3173-53-3, Cyclohexyl isocyanate 3179-56-4, Acetyl cyclohexanesulfonyl peroxide 3188-13-4, Chloromethyl ethyl ether 3248-28-0, Dipropionyl peroxide 3268-49-3 3275-73-8, Nicotine tartrate 3282-30-2, Trimethylacetyl chloride 3497-00-5, Phenyl phosphorus thiodichloride 3689-24-5 3724-65-0, Crotonic acid 3811-04-9, Potassium chlorate 3926-62-3, Sodium chloroacetate 3982-91-0, Thiophosphoryl chloride 4016-11-9, 1,2-Epoxy-3-ethoxypropane 4098-71-9 4109-96-0, Dichlorosilane 4170-30-3, Crotonaldehyde 4300-97-4 4316-42-1, N-n-Butylimidazole 4419-11-8, 2,2'-Azodi(2,4-dimethylvaleronitrile) 4421-50-5 4435-53-4, Butoxyl 4452-58-8, Sodium percarbonate 4472-06-4, Carbonazidodithioic acid 4484-72-4, Dodecyltrichlorosilane 4528-34-1 4547-70-0 4591-46-2 4682-03-5, Diazodinitrophenol 4795-29-3, Tetrahydrofurfurylamine 4904-61-4, 1,5,9-Cyclododecatriene 5283-66-9, Octyltrichlorosilane 5283-67-0, Nonyltrichlorosilane 5329-14-6, Sulfamic acid 5419-55-6, Triisopropyl borate 5610-59-3, Silver fulminate 5637-83-2, Cyanuric triazide 5653-21-4 5894-60-0, Hexadecyltrichlorosilane 5970-32-1, Mercury salicylate 6023-29-6 6275-02-1 6423-43-4 6427-21-0, Methoxymethyl isocyanate 6484-52-2, Nitric acid ammonium salt, properties 6484-52-2D, Ammonium nitrate, mixts. with fuel oils 6505-86-8, Nicotine sulfate 6659-60-5, 1,2,4-Butanetriol trinitrate 6842-15-5, Propylene tetramer 7304-92-9 7332-16-3, Inositol hexanitrate 7429-90-5, Aluminum, miscellaneous 7429-90-5D, Aluminum, alkyl derivs. 7439-90-9, Krypton, miscellaneous 7439-92-1D, Lead, compds. 7439-93-2, Lithium, miscellaneous 7439-93-2D, Lithium, alkyl derivs. 7439-95-4, Magnesium, miscellaneous 7439-95-4D, Magnesium, alkyl derivs. 7439-97-6, Mercury, miscellaneous 7439-97-6D, Mercury, compds. 7440-01-9, Neon, miscellaneous 7440-09-7, Potassium, miscellaneous 7440-17-7, Rubidium, miscellaneous 7440-21-3,

Silicon, miscellaneous 7440-23-5, Sodium, miscellaneous 7440-28-0D, Thallium, compds. 7440-29-1, Thorium, miscellaneous 7440-31-5D, Tin, org. compds. 7440-32-6, Titanium, properties 7440-36-0, Antimony, miscellaneous 7440-36-0D, Antimony, inorg. and org. compds. 7440-37-1, Argon, miscellaneous 7440-38-2, Arsenic, miscellaneous 7440-39-3, Barium, miscellaneous 7440-39-3D, Barium, alloys 7440-39-3D, Barium, compds. 7440-41-7, Beryllium, miscellaneous 7440-41-7D, Beryllium, compds. 7440-43-9D, Cadmium, compds. 7440-44-0, Carbon, miscellaneous 7440-45-1, Cerium, miscellaneous 7440-46-2, Cesium, miscellaneous 7440-55-3, Gallium, miscellaneous 7440-58-6, Hafnium, miscellaneous 7440-59-7, Helium, miscellaneous 7440-61-1, Uranium, miscellaneous 7440-63-3, Xenon, miscellaneous 7440-66-6, Zinc, miscellaneous 7440-67-7, Zirconium, miscellaneous 7440-70-2, Calcium, miscellaneous 7440-70-2D, Calcium, alloys 7446-09-5, Sulfur dioxide, miscellaneous 7446-11-9, Sulfur trioxide, miscellaneous 7446-14-2, Lead sulfate 7446-18-6, Thallium sulfate 7446-70-0, Aluminum chloride (AlCl3), miscellaneous 7487-94-7, Mercuric chloride, miscellaneous 7488-56-4, Selenium disulfide 7521-80-4, Butyltrichlorosilane 7550-45-0, Titanium tetrachloride, miscellaneous 7570-26-5, 1,2-Dinitroethane 7572-29-4, Dichloroacetylene 7578-36-1 7580-67-8, Lithium hydride 7601-89-0, Sodium perchlorate 7601-90-3, Perchloric acid, miscellaneous 7616-94-6, Perchloryl fluoride 7631-89-2, Sodium arsenate 7631-99-4, Sodium nitrate, miscellaneous 7632-00-0, Sodium nitrite 7632-51-1, Vanadium tetrachloride 7637-07-2, Boron trifluoride, miscellaneous 7645-25-2, Lead arsenate 7646-69-7, Sodium hydride 7646-78-8, Stannic chloride, miscellaneous 7646-85-7, Zinc chloride, miscellaneous 7646-93-7, Potassium hydrogen sulfate 7647-01-0, Hydrogen chloride, miscellaneous 7647-18-9, Antimony pentachloride 7647-19-0, Phosphorus pentafluoride 7664-38-2, Phosphoric acid, miscellaneous 7664-38-2D, Phosphoric acid, esters
7664-39-3, Hydrogen fluoride,
miscellaneous 7664-41-7, Ammonia, miscellaneous 7664-93-9, Sulfuric acid, miscellaneous 7681-38-1, Sodium hydrogen sulfate 7681-49-4, Sodium fluoride, miscellaneous 7681-52-9, Sodium hypochlorite 7697-37-2, Nitric acid, miscellaneous 7704-34-9, Sulfur, miscellaneous 7705-07-9D, Titanium trichloride, mixts. 7705-08-0, Ferric chloride, miscellaneous 7718-98-1, Vanadium trichloride 7719-09-7, Thionyl chloride 7719-12-2, Phosphorus trichloride 7722-64-7, Potassium permanganate
(packaging and transport of, stds. for)

IT 7722-84-1, Hydrogen peroxide (H2O2), miscellaneous 7723-14-0, Phosphorus, miscellaneous 7726-95-6, Bromine, miscellaneous 7727-15-3, Aluminum bromide 7727-18-6, Vanadium oxytrichloride 7727-21-1, Potassium persulfate 7727-37-9, Nitrogen, miscellaneous 7727-37-9D, Nitrogen, mixts. with rare gases 7727-54-0, Ammonium

persulfate 7738-94-5, Chromic acid (H2CrO4) 7756-94-7, Triisobutylene 7757-79-1, Potassium nitrate, miscellaneous 7758-01-2, Potassium bromate 7758-09-0, Potassium nitrite 7758-19-2, Sodium chlorite 7758-94-3, Ferrous chloride 7761-88-8, Silver nitrate, miscellaneous 7773-03-7, Potassium bisulfite 7775-09-9, Sodium chlorate 7775-14-6, Sodium dithionite 7778-39-4, Arsenic acid 7778-44-1, Calcium arsenate 7778-54-3, Calcium hypochlorite 7778-66-7 7778-74-7, Potassium perchlorate 7779-86-4, Zinc dithionite 7779-88-6, Zinc nitrate 7782-39-0, Deuterium, miscellaneous **7782-41-4**, Fluorine, miscellaneous 7782-44-7, Oxygen, miscellaneous 7782-44-7D, Oxygen, mixts. with rare gases 7782-49-2, Selenium, miscellaneous 7782-50-5, Chlorine, miscellaneous 7782-65-2, Germane 7782-78-7, Nitrosylsulfuric acid 7782-79-8D, Hydrazoic acid, copper complexes 7782-99-2, Sulfurous acid, miscellaneous 7783-06-4, Hydrogen sulfide, miscellaneous 7783-07-5, Hydrogen selenide (H2Se) 7783-08-6, Selenic acid 7783-33-7 7783-41-7, Oxygen difluoride **7783-54-2, Nitrogen trifluoride**
7783-56-4, Antimony trifluoride 7783-60-0, Sulfur tetrafluoride 7783-61-1, Silicon tetrafluoride 7783-66-6, Iodine pentafluoride 7783-70-2, Antimony pentafluoride 7783-79-1, Selenium hexafluoride 7783-80-4, Tellurium hexafluoride 7783-81-5, Uranium hexafluoride 7783-82-6, Tungsten hexafluoride 7783-91-7, Silver chlorite 7784-08-9 7784-21-6, Aluminum hydride 7784-30-7, Aluminum phosphate 7784-42-1, Arsine 7784-46-5, Sodium arsenite 7786-30-3D, Magnesium chloride (MgCl2), mixt. with chlorates 7787-36-2, Barium permanganate 7787-41-9, Barium selenate 7787-71-5, Bromine trifluoride 7788-97-8, Chromic fluoride 7789-09-5, Ammonium dichromate 7789-18-6, Cesium nitrate 7789-21-1, Fluorosulfonic acid 7789-23-3, Potassium fluoride 7789-29-9, Potassium bifluoride 7789-30-2, Bromine pentafluoride 7789-38-0, Sodium bromate 7789-59-5, Phosphorus oxybromide 7789-60-8, Phosphorus tribromide 7789-61-9, Antimony tribromide 7789-69-7, Phosphorus pentabromide 7789-78-8, Calcium hydride 7790-59-2 7790-69-4, Lithium nitrate 7790-91-2, Chlorine trifluoride 7790-93-4, Chloric acid 7790-94-5, Chlorosulfonic acid 7790-98-9, Ammonium perchlorate 7790-99-0, Iodine monochloride 7791-10-8, Strontium chlorate 7791-23-3, Selenium oxychloride 7791-25-5, Sulfuryl chloride 7791-27-7, Disulfuryl chloride 7803-51-2, Phosphine 7803-52-3, Stibine 7803-54-5, Magnesium diamide 7803-55-6, Ammonium metavanadate 7803-57-8, Hydrazine hydrate 7803-62-5, Silane, miscellaneous 7803-63-6, Ammonium hydrogen sulfate 8004-09-9 8006-19-7, Amatol 8006-28-8, Soda lime 8007-56-5, Nitrohydrochloric acid 8007-58-7 8012-74-6, London Purple 8014-95-7, Fuming sulfuric acid 8049-17-0, Ferrosilicon 8050-88-2, Celluloid 8063-77-2 8065-53-0, Hexolite 8066-33-9, Pentolite 8070-50-6 9003-53-6, Polystyrene 9004-70-0, Collodion 9056-38-6, Nitrostarch

9080-17-5, Ammonium polysulfide 10022-31-8, Barium nitrate 10024-97-2, Nitrogen oxide (N2O), properties 10025-78-2, Trichlorosilane 10025-85-1, Nitrogen trichloride 10025-87-3, Phosphorus oxychloride 10025-91-9, Antimony trichloride 10026-04-7, Silicon tetrachloride 10026-11-6, Zirconium tetrachloride 10026-13-8, Phosphorus pentachloride 10031-13-7 10031-87-5, 2-Ethylbutyl acetate 10034-81-8, Magnesium perchlorate 10034-85-2, Hydrogen iodide 10035-10-6, Hydrogen bromide, miscellaneous 10039-54-0, Hydroxylamine sulfate 10042-76-9, Strontium nitrate 10045-94-0, Mercuric nitrate 10049-04-4, Chlorine dioxide 10099-74-8, Lead nitrate 10101-50-5 10102-06-4, Uranyl nitrate 10102-12-2, Selenium nitride 10102-18-8, Sodium selenite 10102-43-9, Nitric oxide, miscellaneous 10102-44-0, Nitrogen dioxide, miscellaneous 10102-49-5, Ferric arsenate 10102-50-8, Ferrous arsenate 10103-50-1, Magnesium arsenate 10118-76-0 10124-37-5, Calcium nitrate 10124-48-8, Mercury ammonium chloride 10124-50-2, Potassium arsenite 10137-74-3, Calcium chlorate 10192-29-7, Ammonium chlorate 10241-05-1, Molybdenum pentachloride 10256-53-8, Methanamine, compd. with trinitromethane, miscellaneous 10294-33-4, Boron tribromide 10294-34-5, Boron trichloride 10306-83-9 10326-21-3, Magnesium chlorate 10326-24-6 10361-95-2, Zinc chlorate 10377-60-3, Magnesium nitrate 10377-66-9, Manganese nitrate 10415-75-5, Mercurous nitrate 10421-48-4, Ferric nitrate 10431-47-7 10544-63-5, Ethyl crotonate 11069-19-5, Dichlorobutene 11071-47-9, Isooctene 11099-22-2 11105-16-1, Zirconium hydride 11122-26-2 11135-81-2 11138-49-1, Sodium aluminate 11140-68-4, Titanium hydride 12001-29-5, Chrysotile 12002-19-6, Mercury nucleate 12002-48-1, Trichlorobenzene 12030-88-5, Potassium superoxide 12031-80-0, Lithium peroxide 12033-49-7, Nitrogen trioxide 12034-12-7, Sodium superoxide 12057-74-8, Magnesium phosphide (Mg3P2) 12125-01-8, Ammonium fluoride 12135-76-1, Ammonium sulfide 12136-15-1, Mercury nitride 12164-94-2, Ammonium azide 12167-20-3, Nitrocresol 12172-67-7, Actinolite 12401-70-6, Potassium monoxide 12401-86-4, Sodium monoxide 12427-38-2, Maneb 12440-42-5, Tin phosphide (Sn3P4) 12504-16-4, Strontium phosphide (Sr3P2) 12627-52-0, Antimony sulfide 12627-52-0D, Antimony sulfide, mixt. with chlorates 12640-89-0, Selenium oxide 12653-71-3, Mercury oxide 12737-18-7, Calcium silicide 12751-03-0, Cordite 12771-08-3, Sulfur chloride 12789-46-7, Amyl acid phosphate 13092-75-6, Silver acetylide 13138-45-9 13225-10-0, .alpha.-Methylglucoside tetranitrate 13319-75-0, Boron trifluoride dihydrate 13410-01-0, Sodium selenate 13424-46-9, Lead azide 13426-91-0, Cupriethylenediamine 13437-80-4, Mercuric arsenate 13444-85-4, Nitrogen triiodide 13446-10-1, Ammonium permanganate 13446-48-5, Ammonium nitrite 13450-97-0, Strontium perchlorate 13453-30-0, Thallium chlorate 13463-39-3, Nickel

carbonyl 13463-40-6, Iron pentacarbonyl 13464-33-0, Zinc arsenate 13464-58-9D, Arsenous acid, copper complexes 13465-73-1, Bromosilane 13465-95-7, Barium perchlorate 13472-08-7 13473-90-0, Aluminum nitrate 13477-00-4, Barium chlorate 13477-10-6, Barium hypochlorite 13477-36-6, Calcium perchlorate 13520-83-7, Uranyl nitrate hexahydrate 13537-32-1, Fluorophosphoric acid 13548-38-4, Chromium nitrate 13597-54-1, Zinc selenate 13597-99-4, Beryllium nitrate 13598-36-2, Phosphonic acid 13637-63-3, Chlorine pentafluoride 13637-76-8, Lead perchlorate 13718-59-7 13746-89-9, Zirconium nitrate 13762-51-1, Potassium borohydride 13766-44-4, Mercury sulfate 13769-43-2, Potassium metavanadate 13770-96-2, Sodium aluminum hydride 13774-25-9 13779-41-4, Difluorophosphoric acid 13780-03-5, Calcium bisulfite 13823-29-5, Thorium nitrate 13840-33-0, Lithium hypochlorite 13840-33-0D, Lithium hypochlorite, mixts. 13843-59-9, Ammonium bromate 13863-88-2, Silver azide 13967-90-3, Barium bromate 13973-87-0, Bromine azide
(packaging and transport of, stds. for)

IT 13973-88-1, Chlorine azide 13987-01-4, Tripropylene 14014-86-9 14019-91-1, Calcium selenate 14293-73-3 14448-38-5, Hyponitrous acid 14519-07-4, Zinc bromate 14519-17-6, Magnesium bromate 14546-44-2, Hydrazine azide 14567-73-8, Tremolite 14644-61-2, Zirconium sulfate 14666-78-5, Diethylperoxydicarbonate 14674-72-7, Calcium chlorite 14696-82-3, Iodine azide (I(N3)) 14977-61-8 15195-06-9 15245-44-0, Lead trinitroresorcinate 15347-57-6, Lead acetate 15457-98-4 15512-36-4, Calcium dithionite 15545-97-8, 2,2'-Azodi(2,4-dimethyl-4-methoxyvaleronitile) 15598-34-2, Pyridine perchlorate 15718-71-5, Ethylenediamine diperchlorate 15825-70-4, Mannitol hexanitrate 15875-44-2, Methylamine perchlorate 16215-49-9, Di-n-butyl peroxydicarbonate 16229-43-9, Vanadyl sulfate 16339-86-9 16646-35-8 16721-80-5, Sodium hydrosulfide 16753-36-9, Copper acetylide 16853-85-3, Lithium aluminum hydride 16871-71-9, Zinc fluorosilicate 16871-90-2, Potassium fluorosilicate 16872-11-0 16893-85-9, Sodium fluorosilicate 16901-76-1, Thallium nitrate 16919-19-0, Ammonium fluorosilicate 16940-66-2, Sodium borohydride 16940-81-1, Hexafluorophosphoric acid 16941-12-1, Chloroplatinic acid 16949-15-8, Lithium borohydride 16949-65-8, Magnesium fluorosilicate 16961-83-4, Fluorosilicic acid 16962-07-5, Aluminum borohydride 17014-71-0, Potassium peroxide 17068-78-9, Anthophyllite 17462-58-7, sec-Butyl chloroformate 17639-93-9, Methyl-2-chloropropionate 17687-37-5, **Urea** nitrate 17702-41-9, Decaborane 17861-62-0 18130-44-4, Titanium sulfate 18414-36-3 18810-58-7, Barium azide 19159-68-3 19287-45-7, Diborane 19287-45-7D, Diborane, mixts. 19624-22-7, Pentaborane 20062-22-0 20236-55-9, Barium styphnate 20600-96-8 20816-12-0, Osmium

tetroxide 20820-44-4 20859-73-8, Aluminum phosphide 21351-79-1, Cesium hydroxide (Cs(OH)) 21569-01-7 21723-86-4 21985-87-5, Pentanitroaniline 22128-62-7, Chloromethylchloroformate 22750-93-2, Ethyl perchlorate 22751-24-2 22826-61-5 23414-72-4, Zinc permanganate 23745-86-0, Potassium fluoroacetate 24167-76-8, Sodium phosphide 24468-13-1, 2-Ethylhexylchloroformate 24884-69-3 25013-15-4, Vinyl toluene 25109-57-3 25134-21-8 25136-55-4, Dimethyldioxane 25154-42-1, Chlorobutane 25154-54-5, Dinitrobenzene 25155-15-1, Cymene 25167-20-8, Tetrabromoethane 25167-67-3, Butylene 25167-70-8, Diisobutylene 25167-80-0, Chlorophenol 25168-05-2, Chlorotoluene 25265-68-3, Methyltetrahydrofuran 25321-14-6, Dinitrotoluene 25322-01-4, Nitropropane 25322-20-7, Tetrachloroethane 25323-30-2, Dichloroethylene 25339-56-4, Heptene 25340-17-4, Diethylbenzene 25377-72-4, n-Amylene 25496-08-6, Fluorotoluene 25497-28-3, Difluoroethane 25497-29-4, Chlorodifluoroethane 25513-64-8 25550-53-2 25550-55-4, Dinitrosobenzene 25550-58-7, Dinitrophenol 25550-58-7D, Dinitrophenol, salts 25567-67-3, Chlorodinitrobenzene 25567-68-4, Chloronitrotoluene 25639-42-3, Methylcyclohexanol 25721-38-4, Lead picrate 25917-35-5, Hexanol 26134-62-3, Lithium nitride 26140-60-3D, Terphenyl, halo derivs. 26249-12-7, Dibromobenzene 26471-56-7, Dinitroaniline 26471-62-5, Toluene diisocyanate 26506-47-8, Copper chlorate 26571-79-9 26618-70-2 26628-22-8, Sodium azide 26638-19-7, Dichloropropane 26645-10-3 26760-64-5, Isopentene 26762-93-6 26914-02-3, Iodopropane 26915-12-8, Toluidine 26952-23-8, Dichloropropene 26952-42-1, Trinitroaniline 27134-26-5, Chloroaniline 27134-27-6, Dichloroaniline 27137-85-5, Dichlorophenyltrichlorosilane 27152-57-4 27176-87-0, Dodecylbenzenesulfonic acid 27195-67-1, Dimethylcyclohexane 27215-10-7 27236-46-0, Isohexene 27254-36-0, Nitronaphthalene 27458-20-4, Butyltoluene 27978-54-7, Hydrazine perchlorate 27986-95-4 27987-06-0, Trifluoroethane 28260-61-9, Trinitrochlorobenzene 28300-74-5, Antimony potassium tartrate 28324-52-9, Pinane hydroperoxide 28479-22-3 28653-16-9 28679-16-5, Trimethylhexamethylenediisocyanate 28805-86-9, Butylphenol 29191-52-4, Anisidine 29306-57-8 29790-52-1, Nicotine salicylate 29903-04-6 29965-97-7, Cyclooctadiene 30236-29-4, Sucrose octanitrate 30525-89-4, Paraformaldehyde 30553-04-9, Naphthylthiourea 30586-10-8, Dichloropentane 30586-18-6, Pentamethylheptane 31058-64-7 31212-28-9, Nitrobenzenesulfonic acid 33453-96-2 33864-17-4 34216-34-7, Trimethylcyclohexylamine 35296-72-1, Butanol 35860-50-5, Trinitrobenzoic acid 35860-51-6, Dinitroresorcinol 35884-77-6, Xylyl bromide 36472-34-1, Chloropropene 37020-93-2, Mercury cyanide (Hg(CN)) 37187-22-7, Acetyl acetone peroxide 37206-20-5, Methyl isobutyl ketone peroxide 37273-91-9, Metaldehyde

37320-91-5, Mercury iodide 37368-10-8, Aluminum vanadium oxide
38139-71-8, Bromide chloride 38232-63-2, Mercurous azide
38483-28-2, Methylene glycol dinitrate 39377-49-6, Copper cyanide
39377-56-5, Lead sulfide 39404-03-0, Magnesium silicide
39409-64-8, TVOPA 39432-81-0 39455-80-6, Ammonium sodium
vanadium oxide 39990-99-3, Lithium acetylide ethylenediamine
complex 40058-87-5, Isopropyl-2-chloropropionate 41195-19-1
41587-36-4, Chloronitroaniline 42296-74-2, Hexadiene 43133-95-5,
Methylpentane 50815-73-1 50874-93-6 51006-59-8 51023-22-4,
Trichlorobutene 51064-12-1 51312-23-3, Mercury bromide
51317-24-9, Lead nitroresorcinate 51325-42-9, Copper selenite
51845-86-4, Ethyl borate 52181-51-8 53014-37-2,
Tetranitroaniline 53408-91-6, Mercury thiocyanate 53422-49-4
53569-62-3 53839-08-0 53906-68-6 54141-09-2, 1,4,-Butynediol
54413-15-9, Tritonal 54727-89-8 54958-71-3 55510-04-8,
Dinitroglycoluril 55810-17-8 56929-36-3 56960-91-9
57607-37-1, Octolite 58164-88-8, Antimony lactate 58499-37-9
58933-55-4 59753-21-8 59917-23-6 60168-33-4 60616-74-2,
Magnesium hydride 60869-68-3 60999-18-0 61061-91-4
61878-56-6 63085-06-3 63283-80-7, Dichloroisopropyl ether
63597-41-1, Octadiene 63885-01-8 63907-41-5 63937-14-4
63938-10-3, Chlorotetrafluoroethane 63988-31-8 64173-96-2
64973-06-4, Arsenic bromide 66634-68-2 67632-66-0 68833-55-6,
Mercury acetylide (Hg(C2H)) 68848-64-6 68975-47-3, Isoheptene
69523-06-4, Ferrocerium
(packaging and transport of, stds. for)

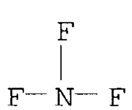
L29 ANSWER 3 OF 6 HCA COPYRIGHT 2004 ACS on STN
85:145351 Fluoro compound production. Vitek, Richard K. (Allied Chemical Corp., USA). U.S. US 3961024 **19760601**, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1963-289778 19630618.

AB Fluoro-nitrogen compds., such as **NF3**, N2F2 and N2F4, were prepd. by direct fluorination of certain compds. contg. N-H bonds. Alkali metal amides, **urea**, biuret, amides, hydrazine, diamines, and melamines reacted with elemental F in the presence of a catalyst at a temp. below the phase-change temp. of the starting material. The catalyst was a metal or metal fluoride which formed an acid salt with **HF**.

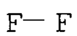
IT **7783-54-2P**
(from alkali metal amides, by fluorination)

RN 7783-54-2 HCA

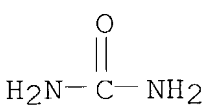
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, reactions
(with alkali metal amides)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **57-13-6**, reactions
(with fluorine in presence of sodium fluoride)
RN 57-13-6 HCA
CN Urea (8CI, 9CI) (CA INDEX NAME)

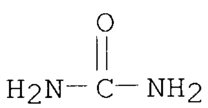


IC C01B021-52
NCL 423406000
CC 49-8 (Industrial Inorganic Chemicals)
ST **nitrogen fluoride**; amide fluorination
IT **7783-54-2P**
(from alkali metal amides, by fluorination)
IT **7782-41-4**, reactions
(with alkali metal amides)
IT **57-13-6**, reactions 302-01-2, reactions
(with fluorine in presence of sodium fluoride)

L29 ANSWER 4 OF 6 HCA COPYRIGHT 2004 ACS on STN
72:62122 Anode reaction in a potassium fluoride-hydrofluoric acid-**urea** system. Watanabe, Nobuatsu; Tasaka, Akimasa; Nakanishi, Koichiro (Kyoto Univ., Kyoto, Japan). Denki Kagaku oyobi Kogyo Butsuri Kagaku, 37(10), 705-10 (Japanese) **1969**. CODEN: DKOKAZ. ISSN: 0366-9297.
AB The effect of (NH2)2CO concn. on the anode reaction in the system KF-**HF**-(NH2)2CO at 130.degree. was studied by the potentiostatic and the potential sweep methods. The anode was made of amorphous C and a Pt rod was used as the reference electrode. The compn. of the anode gas depended on the anode potential, anode c.d., and concn. of (NH2)2CO. The potential at which **NF3** and F2O + **F2** were detected shifted to the pos. side with increasing concn. of (NH2)2CO. When the concn. of (NH2)2CO was kept const., the compn. of gas changed from (N2 + CO2) to (**NF3**) to (F2O + **F2**) with the change of potential to more noble values. When the potential was kept const., the compn. of gas changed from (F2O + **F2**) to (**NF3**) to (N2 + CO2) with the increasing concn. of (NH2)2 cO. The c.d. for **NF3**

depended on the concn. of (NH2)2CO. It reached a max. value of >55% at 2-3 mole % (NH2)2CO. The c.d. of formation of **NF3** was lower than that of the KF-**HF**-NH4F system owing to the generation of N2, CO2, CF4, N2O, and F2O + **F2**. The optimum condition of practical operation was: concn. of (NH2)2CO 2-3 mole %, c.d. 10-3-10-2 A/cm2, anode potential 5.0-5.5 V vs. Pt electrode. A considerable amt. of CF4 was contained in the product.

IT **57-13-6**, reactions
(electrolysis of potassium fluoride and hydrofluoric acid medium in presence of, anode gas compn. in relation to)
RN 57-13-6 HCA
CN Urea (8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3**, reactions
(electrolysis of, with potassium fluoride, **urea** effect on anode gas compn. in)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

CC 77 (Electrochemistry)
ST **urea** electrolysis fluorides; electrolysis fluorides **urea**; fluorides electrolysis **urea**; **nitrogen trifluoride** prepn; trifluoride N prepn
IT Anodes
(carbon, in electrolysis of potassium fluoride in hydrofluoric acid medium, **urea** effect on compn. of gases from)
IT **57-13-6**, reactions
(electrolysis of potassium fluoride and hydrofluoric acid medium in presence of, anode gas compn. in relation to)
IT 7789-23-3
(electrolysis of, with hydrofluoric acid, **urea** effect on anode gas compn. in)
IT **7664-39-3**, reactions
(electrolysis of, with potassium fluoride, **urea** effect on anode gas compn. in)

L29 ANSWER 5 OF 6 HCA COPYRIGHT 2004 ACS on STN
60:50083 Original Reference No. 60:8802c-d Nuclear magnetic antishielding of nuclei in molecules. Magnetic moments of 19F, 14N, and 15N. Baker, Milton R.; Anderson, Charles H.; Ramsey, Norman F.

(Harvard Univ.). Physical Review, 133(6A), 1533-6 (Unavailable)
1964. CODEN: PHRVAO. ISSN: 0031-899X.

AB The combination of mol. beam data on spin-rotational interactions in mols. with chem. shift data was used to calc. the paramagnetic part of the nuclear magnetic shielding const. for F in **HF** and **F2**. With the assumption of the sign of the spin-rotational const. in 15N2 as pos. (i.e., a net neg. rotational magnetic field at the N nucleus), the paramagnetic part of the nuclear magnetic shielding const. in N2 was calcd. The results, when combined with reliable calcns. of the diamagnetic part of the shielding const., yield the total shielding consts. These are: F in **HF**, .sigma. = (414.9 .+-. 1.4) .times. 10-6; F in **F2**, .sigma. = (-210 .+-. 8.0) .times. 10-6; N in N2, .sigma. = (-101 .+-. 25.0) .times. 10-6, and demonstrate the phenomenon of nuclear magnetic antishielding in **F2** and N2, as well as in other compds. Use of these shielding consts. permits considerable improvement in the estimates of the bare nuclear magnetic moments of F and N. The results are .mu.N(F) = 2.628353 .+-. 0.000005, .mu.N(14N) = 0.403562 .+-. 0.000010, .mu.N(15N) = -0.283049 .+-. 0.000007 .times. 10-9 m.

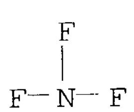
IT **7782-41-4**, Fluorine.
(nuclear magnetic antishielding and nuclear magnetic moment of)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7664-39-3**, Hydrofluoric acid
(nuclear magnetic resonance of F in, nuclear magnetic moment and)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

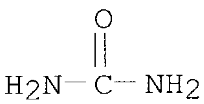
HF

IT **7783-54-2, Nitrogen fluoride, NF3**
(nuclear magnetic resonance of F in, nuclear magnetic moment in relation to)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **57-13-6, Urea**

(nuclear magnetic resonance of N in, nuclear magnetic moment in relation to)
RN 57-13-6 HCA
CN Urea (8CI, 9CI) (CA INDEX NAME)



CC 10 (Spectra and Some Other Optical Properties)
IT **7782-41-4**, Fluorine.
(nuclear magnetic antishielding and nuclear magnetic moment of)
IT 7637-07-2, Boron fluoride **7664-39-3**, Hydrofluoric acid
7783-55-3, Phosphorus fluoride, PF3
(nuclear magnetic resonance of F in, nuclear magnetic moment and)
IT 2551-62-4, Sulfur fluoride, SF6 **7783-54-2**,
Nitrogen fluoride, NF3 7783-56-4,
Antimony fluoride, SbF3 7783-61-1, Silicon fluoride, SiF4
7783-70-2, Antimony fluoride, SbF5 7783-79-1, Selenium fluoride,
SeF6 7783-80-4, Tellurium fluoride, TeF6 7784-35-2, Arsenic
fluoride, AsF3 7787-49-7, Beryllium fluoride 7787-71-5, Bromine
fluoride, BrF3 7790-91-2, Chlorine fluoride, ClF3 16027-92-2,
Phosphorus fluoride, PF
(nuclear magnetic resonance of F in, nuclear magnetic moment in relation to)
IT 51-92-3, Ammonium, tetramethyl **57-13-6, Urea**
60-35-5, Acetamide 121-44-8, Triethylamine 142-84-7,
Dipropylamine 302-01-2, Hydrazine 7664-41-7, Ammonia
7803-49-8, Hydroxylamine 14798-03-9, Ammonium
(nuclear magnetic resonance of N in, nuclear magnetic moment in relation to)

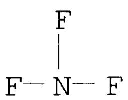
L29 ANSWER 6 OF 6 HCA COPYRIGHT 2004 ACS on STN
55:1161 Original Reference No. 55:184a-b Electrolytic production of **nitrogen trifluoride.** Schmeisser, Martin GB
840026 **19600706** (Unavailable). APPLICATION: GB .
AB **NF3** is produced by the electrolysis of **urea** in anhyd. **HF** in high purity and with yields of about 50%. The voltage is about 6. In addn. to small amts. of CF4 and F2O, as well as high-mol.-wt. compds. contg. C and **F**, the new **process** produces appreciable amts. of NH3, COF2, and CO2. Thus, 200 g. **urea** was dissolved at -10.degree. in 2 l. anhyd. **HF** to give a soln. of CO(NH2)2.2HF. The soln. was electrolyzed at the same temp. with 6 v. and 20 amp. The volatile reaction products were passed through tubes contg. solid KF to remove entrained **HF**, then washed with aq. alk. Na2S2O3 to remove COF2 and F2O. Entrained H2O vapor from the Na2S2O3 soln. was

removed in a trap held at -78.degree.. The crude product was
fractionated at 183-196.degree. in vacuo, removing all impurities
except 1% CF4.

IT **7783-54-2, Nitrogen fluoride,**
NF3
(manuf. by electrolysis of **urea**)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 4 (Electrochemistry)

IT **7783-54-2, Nitrogen fluoride,**
NF3
(manuf. by electrolysis of **urea**)

IT 13770-40-6, Amidogen (NH2)
(manuf. by **urea** electrolysis)

IT 353-50-4, Carbonyl fluoride
(manuf. of, by **urea** electrolysis)

=> d l30 1-15 cbib abs hitstr hitind

L30 ANSWER 1 OF 15 HCA COPYRIGHT 2004 ACS on STN

137:319206 Dry etching method and apparatus for semiconductor device
fabrication. Sakai, Takayuki; Ohiwa, Tokuhisa (Kabushiki Kaisha
Toshiba, Japan). U.S. Pat. Appl. Publ. US 2002155724 A1 20021024,
11 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-124247
20020418. PRIORITY: JP 2001-121257 20010419.

AB A dry etching process and app. which do not use fluorocarbons as the
etchant are claimed. In dry etching a semiconductor workpiece, a
mixt. of a C-free, **F**-contg. **gas** and a **F**
-free, C-contg. gas was used as an etching gas.

IT **7664-39-3, Hydrogen fluoride,** processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
(**dry** etchant for semiconductor device fabrication)

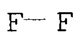
RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

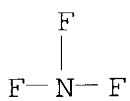
HF

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)



RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01L021-302
ICS H01L021-461
NCL 438710000
CC 76-11 (Electric Phenomena)
IT 64-17-5, Ethanol, processes 74-82-8, Methane, processes 2551-62-4, Sulfur hexafluoride 7637-07-2, Boron trifluoride, processes **7664-39-3, Hydrogen fluoride**, processes **7782-41-4, Fluorine, processes 7783-54-2, Nitrogen trifluoride** 7787-71-5, Bromine trifluoride 7790-91-2, Chlorine trifluoride
(**dry** etchant for semiconductor device fabrication)

L30 ANSWER 2 OF 15 HCA
128:56347 Manufacture of semiconductor device by dry etching. Sugino, Shigeyuki (Fujitsu Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09321025 A2 **19971212** Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-136199 19960530.
AB The manuf. method involves (1) forming an element-isolation oxide film on a semiconductor substrate via a pad oxide film and a Si thin film by selectively oxidizing the substrate using a Si3N4 film as an oxidn. resistant film, (2) etching using a reactive **gas** contg. a **F**-based **gas** (partial pressure Pf) and a Cl-based gas (partial pressure Pcl) at Pf > Pcl, and (3) continuously etching at higher Pcl by controlling a flow ratio of the gases. The manuf. method is useful for continuously dry etching a Si and Si3N4 film without damaging to the substrate.
IT **7664-39-3, Hydrogen fluoride**, uses **7782-41-4**, Fluorine, uses **7783-54-2, Nitrogen trifluoride**
(continuously **dry** etching of Si and Si3N4 film using **F** and Cl **gas** in semiconductor device manuf.)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

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   F
   |
F— N— F
```

IC ICM H01L021-3065
ICS C23F004-00; H01L021-316
CC 76-3 (Electric Phenomena)
ST semiconductor dry etching silicon nitride; **fluorine** chlorine **gas** silicon etching semiconductor; etching gas flow ratio controlling semiconductor
IT Semiconductor device fabrication
(continuously dry etching of Si and Si3N4 film using **F** and Cl **gas** in semiconductor device manuf.)
IT Etching
(dry; continuously dry etching of Si and Si3N4 film using **F** and Cl **gas** in semiconductor device manuf.)
IT 7440-21-3, Silicon, processes 12033-89-5, Silicon nitride, processes
(continuously dry etching of Si and Si3N4 film using **F** and Cl **gas** in semiconductor device manuf.)
IT 7647-01-0, Hydrogen chloride, uses **7664-39-3, Hydrogen fluoride**, uses **7782-41-4**, Fluorine, uses 7782-50-5, Chlorine, uses **7783-54-2, Nitrogen trifluoride** 7790-89-8, Chlorine fluoride 7790-91-2, Chlorotrifluoride
(continuously **dry** etching of Si and Si3N4 film using **F** and Cl **gas** in semiconductor device manuf.)

L30 ANSWER 3 OF 15 HCA COPYRIGHT 2004 ACS on STN
99:160878 Tetrafluoroammonium xenonheptafluoride (NF4XeF7) and ditetrafluoroammonium xenonoctafluoride ((NF4)2XeF8). Christe, Karl O.; Wilson, William W. (United States Dept. of the Navy, USA). U. S. Pat. Appl. US 391786 A0 **19830819**, 9 pp. Avail. NTIS Order No. PAT-APPL-6-391 786. (English). CODEN: XAXXAV.

APPLICATION: US 1982-391786 19820624.

AB NF4XeF7 was prepd. from NF4HF2 and XeF6 and was photolytically decompd. by blue 4880 .ANG. laser light to give (NF4)2XeF8 which, in energetic applications, has the highest **NF3-F2** yield of any presently known compd. and also gives the highest theor. detonation pressures in explosive compns. Thus, 15.54 CsF and 15.65 mmol NF4SbF6 were mixed with 9 mL **dry HF** , processed, reacted with 17.87 mmol XeF6, and treated in several stages to remove volatiles and to give 15.54 mmol (93.5%) NF4XeF7. Photolytic decompn. gave the (NF4)2XF8 which is useful for explosive and propellant formulations.

CC 50-1 (Propellants and Explosives)

L30 ANSWER 4 OF 15 HCA COPYRIGHT 2004 ACS on STN

95:34634 Syntheses and properties of FOIF4O, ClOIF4O, HOIF4O, and tetrafluoroperiodates. Christe, Karl O.; Wilson, Richard D.; Schack, Carl J. (Rocketdyne Div., Rockwell Int. Corp., Canoga Park, CA, 91304, USA). Inorganic Chemistry, 20(7), 2104-14 (English) **1981**. CODEN: INOCAJ. ISSN: 0020-1669.

AB Mixts. of cis- and trans-CsIF4O2 were prepd. by the interaction of CsIO4 with **anhyd. HF**, BrF5, ClF3, ClF5, or **F2**. The vibrational spectra of these mixts. were recorded, and partial assignments are given for cis- and trans-IF4O2-. The assignments for trans-IF4O2- are supported by a normal-coordinate anal. The CsIF4O2 salt dissolves in MeCN with the formation of IF4O2- anions but undergoes solvolysis in **anhyd. HF** with formation of HOIF4O. An improved synthesis of HOIF4O from CsIF4O2 and BiF5 in **anhyd. HF** is reported, and its Raman and 19F NMR spectra are recorded. The interaction of CsIF4O2 with NF4SbF6 in **anhyd. HF** results in solns. contg. NF4+, HF2-, and HOIF4O. When standing or when pumped to dryness, these mixts. decomp. to yield **NF3** and the new compd. FOIF4O in high yield. The latter compd., the first known example of an iodine hypofluorite, was thoroughly characterized and shown by vibrational and NMR spectroscopy to be a mixt. of the cis and trans isomers. For comparison, the vibrational spectra of IF5O were also recorded. The reaction of CsIF4O2 with ClOSO2F yielded the novel compd. ClOIF4O. The fluorination reactions of CsIO4, CsIF4O2, IF5O, and HOIF4O with elementary F were also studied.

IT **7664-39-3**, reactions **7782-41-4**, reactions
(reaction of, with cesium periodate)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

CC 78-8 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 73
IT **7664-39-3**, reactions **7782-41-4**, reactions
7789-30-2 7790-91-2 13637-63-3
(reaction of, with cesium periodate)

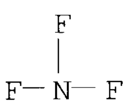
L30 ANSWER 5 OF 15 HCA COPYRIGHT 2004 ACS on STN
93:87468 Synthesis and properties of NF4+ClO4- and NF4+HF2-.nHF and some reaction chemistry of tetrafluoroammonium(+1) salts. Christe, Karl O.; Wilson, William W.; Wilson, Richard D. (Rocketdyne Div., Rockwell Int. Corp., Canoga Park, CA, 91304, USA). Inorganic Chemistry, 19(6), 1494-8 (English) **1980**. CODEN: INOCAJ. ISSN: 0020-1669.

AB The possibility of prepg. NF4+SO4- (X = Cl, Br, I) salts by metathesis between NF4SbF6 and CsXO4 is **anhyd. HF** soln. at -78.degree. was studied. Of these NF4XO4 salts, NF4ClO4 was isolated and characterized by vibrational and 19F NMR spectroscopy. The unstable white solid NF4ClO4 decompd. at 25.degree. to give **NF3** and FOClO3 in high yield. The NF4BrO4 salt is of marginal stability in **HF** soln. and decomps. to **NF3**, O2, and FBrO2. Attempts to isolate NF4BrO4 as a solid resulted in explosions. The NF4IO4 salt could not be prepd. due to the facile fluorination of IO4- to IF4O2- by either **HF** or BrF5. Attempts to prep. NF4+XF4O- (X = Cl, Br) salts by metathesis between NF4SbF6 and CsXF4O in BrF5 soln. at 25.degree. were unsuccessful; with BrF4O-, fluoride abstraction occurred, resulting in the formation of **NF3**, **F2**, and BrF3O, whereas CsClF4O underwent a displacement reaction with BrF5 to give CsBrF6 and ClF3O. The metathetical synthesis of NF4NO3 could not be studied in **HF** due to the reaction of NO3- with **HF** to give NO2+, H2O, and HF2-. The metathesis between NF4SbF6 and CsF in **HF** at -78.degree. did not produce NF4+F- but produced an unstable white solid of the compn. NF4+HF2-.nHF. The compn., thermal stability, spectroscopic properties, and decompn. products of this solid were studied. The NF4+HF2- salt is stable in **HF** soln. at 25.degree. and the synthetic usefulness of these solns. for the synthesis of other NF4+ salts is briefly discussed. Attempts to prep. NCl4+ and NCl2O+ salts by F-Cl exchange between BCl3 and NF4+ and NF2O+ were unsuccessful.
CC 78-5 (Inorganic Chemicals and Reactions)

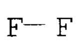
L30 ANSWER 6 OF 15 HCA COPYRIGHT 2004 ACS on STN
91:41521 Self-clinkering nitrogen tetrafluoride(1+) ion compositions for **nitrogen trifluoride-fluorine gas** generators. Christe, Karl O.; Schack, Carl J.; Wilson, Richard D. (Rockwell International Corp., USA). U.S. US 4152406 **19790501**, 6 pp. (English). CODEN: USXXAM. APPLICATION: US 1976-734153 19761020.

AB Compds. having NF4+ as the cation and that decomp. to a gaseous mixt. of **NF3** and **F2** contg. no gaseous Lewis acids are prepd. without need for clinker-forming additives for their complexing. The synthesis is based on metathetical and displacement reactions in **anhyd. HF** of NF4BF4 with SnFn4, and TiF4 and of NF4SbF6 with Cs2SnF6 or Cs2TiF6.

IT **7783-54-2**
(reaction of, with fluorine and titanium fluoride)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, reactions
(reaction of, with **nitrogen fluoride** and titanium fluoride)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IC C01G021-52; C01G023-02
NCL 423351000
CC 49-7 (Industrial Inorganic Chemicals)
ST fluoroammonium salts manuf; fluorostannate salts manuf; fluorotitanate salts manuf; **nitrogen fluoride** fluorine generator
IT 7783-63-3
(reaction of, with fluorine and **nitrogen fluoride**)
IT **7783-54-2**
(reaction of, with fluorine and titanium fluoride)
IT **7782-41-4**, reactions
(reaction of, with **nitrogen fluoride** and titanium fluoride)

L30 ANSWER 7 OF 15 HCA COPYRIGHT 2004 ACS on STN

90:106624 Bis(tetrafluoroammonium) hexafluoronickelate high energy solid propellant oxidizer. Christe, Karl O. (Rockwell International Corp., USA). U.S. US 4108965 **19780822**, 3 pp. (English). CODEN: USXXAM. APPLICATION: US 1976-732623 19761015.

AB (NF4)NiF6, a high-energy oxidizer useful for solid propellants and **NF3-F2** gas generators, is prepd. from Cs2NiF6 and NF4SbF6 in **anhyd. HF**. Thus, 13.45 Cs2NiF6 and 27.9 mmol NF4SbF6 were stirred with 10 mL liq. **anhyd. HF** in a U-trap for 30 min at 25.degree., cooled to -78.degree., and the contents filtered to a 2nd U-trap. The solid retained by the filter consisted of 10.0 g CsSbF6 and the solid (4.4 g) obtained after evapn. of the **HF** from the filtrate consisted of a mixt. of (NF4)2NiF6 81.7, NF4SbF6 14.4, and CsSbF6 3.9 mol.%.

IC C01G053-00

NCL 423351000

CC 50-2 (Propellants and Explosives)

L30 ANSWER 8 OF 15 HCA COPYRIGHT 2004 ACS on STN

90:57388 Tetrafluoroammonium tetrafluoroborate. Christe, Karl O.; Shack, Carl J.; Wilson, Richard D. (Rockwell International Corp., USA). U.S. US 4107275 **19780815**, 3 pp. (English). CODEN: USXXAM. APPLICATION: US 1976-731198 19761012.

AB NF4BF4 is prepd. by heating SbF5 to 250.degree. in the presence of an excess **NF3** and **F2**, and the NF4SbF6 formed is combined with CsBF4 in **anhydride HF**. Thus, SbF5 1.8, **NF3** 3.6, and **F2** 3.6 mol were mixed at -196.degree. and heated to 250.degree. for 72 h in a cylinder. The unreacted **NF3** and **F2** were removed at room temp. to obtain 1.8 mol NF6SbF6. A mixt. of CsBF4 2.15 and NF4SbF6 2.27 mol was added with 27.5 mol **anhyd. HF**, and the mixt. was agitated at 25.degree. for 1 h and cooled to -78.degree.. The CsSbF6 ppt. was filtered from the NF4BF4 soln. and the filtrate was pumped to dryness resulting in 310 g of product contg. 95 mol % NF4BF4.

IC C01B035-14

NCL 423276000

CC 49-5 (Industrial Inorganic Chemicals)

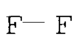
L30 ANSWER 9 OF 15 HCA COPYRIGHT 2004 ACS on STN

85:13133 Low-temperature ultraviolet photolysis and its application to the synthesis of novel and known tetrafluoronitrogen(1+) salts. Christe, Karl O.; Schack, Carl J.; Wilson, Richard D. (Rocketdyne, Div., Rockwell Int., Canoga Park, CA, USA). Inorganic Chemistry, 15(6), 1275-82 (English) **1976**. CODEN: INOCAJ. ISSN: 0020-1669.

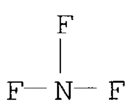
AB Low-temp. uv photolysis was used to synthesize the novel NF4+ salts NF4PF6 and NF4GeF5 and the known salts NF4BF4 and NF4AsF6. This

technique offers the first convenient, simple, and high-yield synthesis for NF4BF4. The NF4PF6 and NF4GeF5 salts were also prepd. from NF4BF4 by displacement reactions with PF5 and GeF4, resp. Treatment of NF4GeF5 with **anhydrous HF** resulted in its conversion to (NF4)2GeF6, and (NF4)3GeF6 was quant. converted back to NF4GeF5 by treatment with an excess of GeF4. The NF4+ salts were characterized by vibrational and 19F NMR spectroscopy and x-ray powder data. A cis-fluorine-bridged polymeric structure is proposed for GeF5- in its NF4+ salt based on the spectroscopic data, its thermal stability, and lack of reaction with either liq. N2F4 or FNO2. The applicability of low-temp. uv photolysis to other reactant systems was briefly studied. The hydrolysis of NF4+ salts was reinvestigated.

IT **7782-41-4**, reactions
    (photolysis of, in presence of fluorine-contg. compds.)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7783-54-2**
    (photolysis of, with boron trifluoride and Group VA pentafluorides)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 78-7 (Inorganic Chemicals and Reactions)
    Section cross-reference(s): 73, 74, 75
IT **7782-41-4**, reactions
    (photolysis of, in presence of fluorine-contg. compds.)
IT **7783-54-2**
    (photolysis of, with boron trifluoride and Group VA pentafluorides)
IT 7637-07-2, reactions 7647-19-0 7783-58-6 7784-36-3
    (photolysis of, with fluorine and **nitrogen trifluoride**)

L30 ANSWER 10 OF 15 HCA COPYRIGHT 2004 ACS on STN
73:134358 Solubility of **F2**, **NF3**, and O2 in **anhydrous** liquid **HF**. Rewick, R. T.; Tolberg, W. E.; Hill, Marion Elzie (Stanford Res. Inst., Menlo Park, CA, USA). Journal of Chemical and Engineering Data, 15(4), 527-30 (English)

1970. CODEN: JCEAAX. ISSN: 0021-9568.
AB The soly. of **F2**, **NF3**, and O2 in **anhyd**. liq. **HF** was measured at several temps. The soly. of **F2** passes through a min. between -0.21 and 19.8.degree. but between -0.21 and -77.2.degree. it can be computed to within 3% of the obsd. value. The heat of soln. is -588 cal mole-1. The soly. of **NF3** was measured at 3 temps.; it does not exhibit a soly. min. similar to that of **F2**. At -77.2.degree. a curved plot of partial pressure vs. molality was obsd. at pressures >1 atm. The heat of soln. is -1533 cal mole-1. The soly. of O2, measured at -0.21 and 19.8.degree., was similar to that of **F2**. The heat of soln. calcd. from the soly, at these 2 temps. is -352 cal mole-1. The soly. of O2 in **HF** at 19.8.degree. and -0.21.degree. was larger by factors of 5 and 10, resp., than the literature values for soly. in H2O at the same temps.

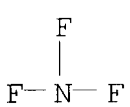
IT **7664-39-3**, properties
  (soly. in anhydrous liq., of gases)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4**, properties **7783-54-2**
  (soly. of, in anhydrous liq. hydrofluoric acid)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 68 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
ST fluorine soly **hydrogen fluoride**; **nitrogen fluorides** soly **hydrogen fluoride**; oxygen soly **hydrogen fluoride**; **hydrogen fluoride** solvent
IT **7664-39-3**, properties
  (soly. in anhydrous liq., of gases)
IT **7782-41-4**, properties 7782-44-7, properties

7783-54-2
(soly. of, in anhydrous liq. hydrofluoric acid)

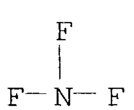
L30 ANSWER 11 OF 15 HCA COPYRIGHT 2004 ACS on STN
69:64427 Analysis of **F2, HF, NF3,**
trans-N2F2, and N2F4 mixtures by gas chromatography. Spears, Larry G.; Hackerman, Norman (TRACTOR, Inc., Austin, TX, USA). Journal of Gas Chromatography, 6(7), 392-3 (English) **1968**. CODEN: JGCRAY. ISSN: 0096-2686.
AB The volatile products of electrolysis of NH4HF2 in **anhyd. HF** were investigated by gas chromatog. by using two 7-ft. F-passivated Monel tubes with cryogenic programming (10.degree./min.) and a combination of 20-ft. Monel column packed with 50% Halocarbon oil 13-21 on 30-50-mesh shredded Teflon and 50 ft. Kel-F tubing packed with 50% Halcarbon oil 13-21 on 30/50 mesh Kel-F molding powder at ambient temp. and He flow rate 50 cc./min. For the 7-ft. Monel column, the retention time (min.) and lower limit of detection (ppm.) were for F 0.2 and 210, **NF3** 5.9 and 180, trans-N2F2 7.8 and 270, N2F4 11.6 and 250, **HF** 31.0 and 220, and for the 70-foot column F 4 and 93.5, **NF3** 4.3 and 6.5, trans-N2F2 4.5 and 88.4; and **HF** 6.3 and 105. By using the 7-foot column, no N2F4 was detected by ir and mass spectral anal.
IT **7664-39-3**, analysis **7782-41-4**, analysis
7783-54-2
(detn. of, in ammonium fluoride (NH4HF2) electrolysis products)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 79 (Inorganic Analytical Chemistry)
ST **nitrogen fluorides** gas chromatog; fluorides N

gas chromatog; gas chromatog **N fluorides;**
chromatog **N fluorides; fluorine**
gas chromatog; ammonium bifluoride electrolysis;
electrolysis ammonium bifluoride

IT **7664-39-3**, analysis **7782-41-4**, analysis
7783-54-2 10036-47-2 13776-62-0
(detn. of, in ammonium fluoride (NH4HF2) electrolysis products)

L30 ANSWER 12 OF 15 HCA

65:94866 Original Reference No. 65:17768c-d High energy oxidizers in solution: the system **F2/NF3/HF.**
Tolberg, W. E.; Stringham, R. S.; Hill, M. E. (Stanford Res. Inst., Menlo Park, CA). Am. Chem. Soc., Div. Fuel Chem., Preprints, 9(1), 136-41 (English) **1965**.

AB An interaction has been observed when F and **NF3** are dissolved in liquid **anhyd. HF.** From this system a liquid was isolated, b. 35.degree., whose mass spectrum contained only NF fragments not related to the known compds. N2F2 and N2F4. The gas d. mol. wt. was 85. No structure has as yet been assigned to the new material. However, the soly. relations and N.M.R. and E.P.R. spectra of this system are consistent with the hypothetical reaction, **NF3** + **F2** .dblarw. NF4+ + F-, occurring in liquid **HF.**

IT **7664-39-3,** Hydrofluoric acid
(fluorine reaction with **NF3** in liquid)

RN 7664-39-3 HCA

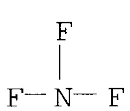
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2, Nitrogen fluoride, NF3**
(reaction with F in liquid **HF**)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4,** Fluorine.
(reaction with **NF3** in liquid **HF**)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

CC 6 (Phase Equilibriums, Chemical Equilbriums, and Solutions)
IT Magnetic resonance absorption
Nuclear magnetic resonance
(of fluorine-**HF**-**NF3** soln.)
IT **7664-39-3**, Hydrofluoric acid
(fluorine reaction with **NF3** in liquid)
IT **7783-54-2, Nitrogen fluoride,**
NF3
(reaction with F in liquid **HF**)
IT **7782-41-4**, Fluorine.
(reaction with **NF3** in liquid **HF**)

L30 ANSWER 13 OF 15 HCA COPYRIGHT 2004 ACS on STN
62:88427 Original Reference No. 62:15741d-e The preparation of fluorodiazonium hexafluoroarsenate (N2F+AsF6-) from cis-difluorodiazine. Moy, David; Young, Archie R., II (Thiokol Chem. Corp., Denville, NJ). Journal of the American Chemical Society, 87(9), 1889-92 (English) **1965**. CODEN: JACSAT. ISSN: 0002-7863.
AB cis-Difluorodiazine and AsF5 react at or below ambient temp. to yield a 1:1 solid adduct. The adduct is stable under an atm. of dry N to 150.degree.. It reacts violently with water but is sol. and stable in **anhyd. HF**. Although no stable deriv. of N2F+ has been reported previously, the 19F N.M.R. spectrum and x-ray diffraction pattern of the adduct strongly suggest an ionic constitution (N2F+AsF6-) in **HF** and in the solid state.
IT **7782-41-4**, Fluorine.
(nuclear magnetic resonance of, in fluorodiazonium hexafluoroarsenate(V))
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

CC 14 (Inorganic Chemicals and Reactions)
IT Arsenic fluoride, AsF5, compd. with N2F2 (1:1)
Nitrogen fluoride, N2F2, compd. with AsF5(1:1)
IT **7782-41-4**, Fluorine.
(nuclear magnetic resonance of, in fluorodiazonium hexafluoroarsenate(V))

L30 ANSWER 14 OF 15 HCA COPYRIGHT 2004 ACS on STN
61:11424 Original Reference No. 61:1886f-h,1887a-b Reaction of

phenylsilicon fluorides with primary amines. Tansjo, L. (Univ. Lund, Swed.). Acta Chemica Scandinavica, 18(2), 465-73 (English) **1964**. CODEN: ACHSE7. ISSN: 0904-213X.

AB cf. preceding abstract. Ph2SiF2 (33.5 g.) in 100 ml. dry Et2O added to 0.15 mole PhMgBr in 100 ml. Et2O, the stirred mixt. refluxed 3 hrs. and kept overnight, Et2O distd., the mixt. held 6 hrs. at 100-110.degree., and Et2O and 150 ml. 2.5N HCl added gave 53% Ph3SiF (I). A vigorous reaction occurred when an aliphatic primary amine was added to PhSiF3 (II); distg. the mixt. gave the amine and a residue that distd. at the b.p. of II and deposited in the cold part of the system as a fuming white solid. When Et2O solns. of II and amine were mixed, a white ppt. of (RNH3)2[SiF5Ph] immediately formed. With PrNH2 0.33 molar equiv. salt was formed per mole of II. Some evidence supported the view that the reaction proceeded to form mainly (PrNH3)2[SiF5Ph] (III), but the presence of all compds. PhSi(NHR)**nF3**-n (R = Pr; n = 0, 1, 2, 3) was indicated. These products (where R = H, Me, Et, Pr, or Bu) were white solids, m. >250.degree., sublimed 225-75.degree. (infrared spectra detd.). They dissolved in H2O to give acidic solns., which became turbid on standing, owing to hydrolysis. III (0.587 g.) and 0.342 g. PhSi(NHPr)3 heated 1 hr. at 60.degree. gave PhSi(NHPr)**F2** and PrNH2. Ph2SiF2 (IV) reacted exothermally with primary amines to yield solids far above the m.p. of the components. No ppt. formed when the 2 components were mixed at room temp. in Et2O or C6H6; in MeCN an increase in cond. occurred, indicating ion formation. **Dry HF** added to solns. of PrNH2 and excess IV in Et2O, and the mixt. held overnight gave a solid with infrared spectrum identical with III. PrNH3F (0.238 g.) and 1.5 g. IV reacted exothermally to give 0.338 g. III and 0.063 g. C6H6, indicating cleavage of the Si-Ph bond. No reaction was observed with I and primary amines, and no increase in cond. was obtained in MeCN. When **dry HF** was added to an Et2O soln. of I and a primary amine, the only solid product was the alkylammonium fluoride. II and excess **dry HF** after 20 hrs. at room temp. gave <1% C6H6; with the triamyl compd. no pentane was formed. Similarly, IV and excess **HF** gave 44% II and C6H6; with I and excess **HF**, all the I was converted to Ph2SiF2, and 43% of this compd. had reacted further to give II.

CC 39 (Organometallic and Organometalloidal Compounds)

L30 ANSWER 15 OF 15 HCA COPYRIGHT 2004 ACS on STN

46:35375 Original Reference No. 46:6015c-i,6016a Perfluorinated tertiary amines. Kauck, Edward A.; Simons, Joseph H. (Minnesota Mining and Manufacturing Co.). GB 666733 **19520220** (Unavailable). APPLICATION: GB .

AB Tertiary perfluoro-alkyl and cycloalkyl amines of the general formulas (CnF2n+1)3N (I) and (CnF2n+1)2N(CF2)mC6F11 (II), resp., where n is 1 or a higher integer and need not be the same for each

of the 3 radicals, and m is 0 or 1, are described. The I are obtained in good yield by electrolyzing the corresponding trialkyl amines or substitution products thereof, such as trialkanolamines in liquid **HF** at a cell potential of 4-8 v. and a c.d. of 20 or more amp./sq. ft. of anode surface. The electrolytic cell consists of a Fe or steel container and Ni anode and Fe or steel-cathode plates in an alternating array suspended from a Fe or steel cover and may be provided with a cooling jacket, an upper outlet for gaseous products, an upper inlet for charging materials, and a bottom outlet for liquid products; a suitable gasket and insulating material for electrode mountings and leads is Teflon; the electrolysis is preferably carried out at atm. pressure and at 0.degree.. The liquid reaction products are immiscible with the electrolyte and can be withdrawn from the bottom of the cell. Thus, electrolysis of 175 g. Et3N in 1800 g. com. **anhyd.** **HF** for 25 hrs. at 5.6 v. and a c.d. of 20 amp./sq. ft. anode surface under the above conditions yields 172 g. of and immiscible reaction product which is washed with aq. KOH and H2SO4 and fractionally distd. to give (C2F5)3N, b. 68-9.degree., nD25 1.258, d435 1.708, dielec. const. at 20.degree. 1.86; in another similar run with Et3N an addnl. fraction of (C2F5)2NCF3, b. 45.degree., nD25 1.253, was obtained; this indicates some mol. fragmentation during the electrolysis. The following compds. are similarly prepd. from Bu3N 150 in **HF** 1800 g., electrolyzed for 74 hrs., (C4F9)3N (III), b755.3 177.2.degree., nD25 1.290, d423 1.856, dielec. const. at 20.degree. 2.15; (C5H11)3N (isomeric mixt.) 150 in **HF** 1800 g., electrolyzed for 94 hrs., an isomeric mixt. of (C5F11)3N, b. 215-16.5.degree., nD26 1.301, d425 1.923; Me3N 175 in **HF** 1800 g., electrolyzed for 19 hrs., (CF3)3N, b. -11%, together with CF4, CHF3, and **NF3**; (iso-Pr)2NEt 102 in **HF** 1800 g., electrolyzed for 34 hrs., [(CF3)2CF]2NC2F5, b. 108.degree., nD26 1.298. PhNMe2 (IV), b. 190-5.degree., nD20 1.558, 48 in **anhyd. HF** 809 g., electrolyzed for 186 hrs. with the gradual addn. of 23.7 g. IV at 5.0-6.0 v. with 17.8 faradays, gives 135 g. of a cell residue (apart from **HF**), from which 73.7 g. of a fluorocarbon-like liquid is obtained; this is washed with alkali and fractionated to yield C6F11N(CF3)3, b. 110-11.degree., nD20 1.286, d420 1.835. Similarly prepd., by the electrolysis of PhCH2NEt2 (V) 185 in **anhyd. HF** 2000 g. for 93 hrs. with the further addn. of V to maintain the initial concn., is C6F11CF2N(C2F5)2, b. 163-5.degree., nD26 1.304, d427 1.892, which solidifies to a glass at 69.degree.. The approx. b.ps. calcd. for (C3F7)3N and (C6F13)3N are 127.degree. and 260.degree., resp. The I are highly stable and unreactive but can react with piperidine and pyridine. Thus, III and piperidine, allowed to stand in a sealed tube at room temp., gives a yellow-orange solid. The I and II do not burn or react with O and can react with K and Na only at elevated temp.; they are colorless

and odorless in the pure form, have exceptionally low b.ps., low n values, dielec. consts., viscosities, and surface tensions; they are unreactive towards concd. HCl, concd. H2SO4, concd. NaOH, 30% H2O2, HNO2, and MeI; they are useful as refrigerants, inert reaction media, solvents, fire-extinguisher fluids, hydraulic-mechanism fluids, heat-transfer media, turbine impellents, transformer liquids, dielectrics, lubricants, and intermediates.

IT **7782-41-4**, Fluorine
(compds., manuf. of)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

CC 4 (Electrochemistry)

IT **7782-41-4**, Fluorine
(compds., manuf. of)

=> d l31 1-42 cbib abs hitstr hitind

L31 ANSWER 1 OF 42 HCA

139:77223 Cleaning gas for semiconductor device production equipment and cleaning method using the gas. Ohno, Hiromoto; Ohi, Toshio (Showa Denko K.K., Japan). PCT Int. Appl. WO 2003054247 A2 20030703, 16 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-JP13002 20021212. PRIORITY: JP 2001-379401 20011213; US 2002-PV391622 20020627.

AB The present invention provides a cleaning gas for semiconductor devices or equipment for producing semiconductor or liq. crystal devices, comprising a **fluorine gas** contg. 1 vol.% or less of oxygen and/or oxygen-contg. compd. The cleaning gas of the present invention enables an efficient prodn. process of semiconductor device with a high etching rate to improve the cleaning efficiency which ensures excellent cost performance.

IT **7782-41-4, Fluorine**, uses
(cleaning **gas**; cleaning gas for semiconductor device prodn. equipment and cleaning method using the gas)

RN 7782-41-4 HCA

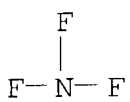
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7664-39-3, Hydrogen fluoride,** processes
7783-54-2, Nitrogen fluoride (
NF3)
(method for **producing** semiconductor device including
decompn. step of decompg. fluoro compd.-contg. gas discharged
from cleaning step)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C23C016-44
ICS H01L021-00; B08B005-00; H01L021-311; H01L021-3065
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 74
IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses
7732-18-5, Water, uses **7782-41-4, Fluorine,** uses
7782-44-7, Oxygen, uses 7783-41-7, Oxygen difluoride 7783-44-0,
Oxygen fluoride (O2F2) 10024-97-2, Nitrogen oxide (N2O), uses
10102-43-9, Nitrogen oxide (NO), uses 10102-44-0, Nitrogen
dioxide, uses 16829-28-0, Oxygen fluoride (O3F2)
(cleaning **gas**; cleaning gas for semiconductor device
prodn. equipment and cleaning method using the gas)
IT 75-73-0, Carbon fluoride (CF4) **7664-39-3, Hydrogen**
fluoride, processes **7783-54-2, Nitrogen**
fluoride (**NF3**) 7783-61-1, Silicon fluoride
(SiF4) 7783-82-6, Tungsten fluoride (WF6)
(method for **producing** semiconductor device including
decompn. step of decompg. fluoro compd.-contg. gas discharged
from cleaning step)

L31 ANSWER 2 OF 42 HCA COPYRIGHT 2004 ACS on STN
138:92253 Production of high-purity **fluorine gas** and
analysis of trace impurities. Torisu, Junichi; Atobe, Hitoshi;

Hoshino, Yasuyuki (Showa Denko K. K., Japan). PCT Int. Appl. WO 2003002454 A2 20030109, 42 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-JP6519 20020627. PRIORITY: JP 2001-199437 20010629; JP 2001-199731 20010629; US 2001-PV306421 20010720; US 2001-PV306422 20010720.

AB High-purity **fluorine gas** is produced by heating a fluoronickel compd. tom 250-600.degree.C and reducing the pressure inside the container to .ltoreq. 0.01 MPa to release a **fluorine gas**, followed by occluding the released **fluorine gas** reduced in the **HF** content to .ltoreq. 500 vol. ppm into a fluorinated compd. The steps of occlusion and release of **fluorine gas** are repeated several times to yield a **fluorine gas** of at least 99.99 vol.% purity with an O2 and CO2 content of .ltoreq. 10 vol. ppm, resp. The fluoronickel compd. can be K3NiF5, K3NiF6, or K3NiF7. For the anal. of trace impurities the fluoronickel compd. is heated at reduced pressure in a container having a fluorinated layer formed on its surface to allow a **fluorine gas** reduced in **HF** content to be occluded into the fluoronickel compd., followed by analyzing the impurities by gas chromatog. The trace impurities can be H2, O2, N2, CH4, CO, CO2, CF4, SF6, **NF3**, He, Ne, Ar, Kr, and Xe. Trace impurities, such as CH4, CO, CO2, CF4, SF6, **NF3**, **HF**, H2O, and F2O can be analyzed by IR spectroscopy by introducing an impurity contg. **fluorine gas** into a cell with a CaF2 window.

IT **7782-41-4P**, Fluorine, preparation
(high-purity; prodn. of high-purity **fluorine gas** and anal. of trace impurities)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

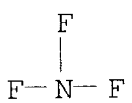
IT **7664-39-3**, Hydrofluoric acid, processes **7783-54-2**, **Nitrogen fluoride** (NF3)
(**prodn.** of high-purity **fluorine gas** and anal. of trace impurities)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C01B007-20
ICS C01G053-08; G01N030-14; G01N021-35; H01S003-225
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 76, 79, 80
IT Absorption
Gas chromatography
IR spectroscopy
Impurities
Trace analysis
(prodn. of high-purity **fluorine gas** and anal. of trace impurities)
IT **7782-41-4P**, Fluorine, preparation
(high-purity; prodn. of high-purity **fluorine gas** and anal. of trace impurities)
IT 74-82-8, Methane, processes 75-73-0, Carbon fluoride (CF4) 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes 1333-74-0, Hydrogen, processes 2551-62-4, Sulfur fluoride (SF6) 7439-90-9, Krypton, processes 7440-01-9, Neon, processes 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7440-63-3, Xenon, processes **7664-39-3**, Hydrofluoric acid, processes 7727-37-9, Nitrogen, processes 7732-18-5, Water, processes 7782-44-7, Oxygen, processes 7783-41-7, Fluorine oxide (F2O) **7783-54-2**, **Nitrogen fluoride** (NF3)
(**prodn.** of high-purity **fluorine gas** and anal. of trace impurities)
IT 14881-07-3 67415-55-8 80164-68-7
(prodn. of high-purity **fluorine gas** and anal. of trace impurities)
IT 7789-75-5, Calcium fluoride (CaF2), uses
(window material of IR cell; prodn. of high-purity **fluorine gas** and anal. of trace impurities)

L31 ANSWER 3 OF 42 HCA
138:9831 Low dielectric constant material and method of processing by

CVD. O'Neill, Mark Leonard; Peterson, Brian Keith; Vincent, Jean Louise; Vrtis, Raymond Nicholas (Air Products and Chemicals, Inc., USA). Eur. Pat. Appl. EP 1260606 A2 20021127, 20 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2002-10229 20020516. PRIORITY: US 2001-863150 20010523.

AB Organofluorosilicate glass films contain both org. species and inorg. fluorines, exclusive of significant amts. of fluorocarbon species. Preferred films are SivOwCxHyFz, where v+w+x+y+z = 100%, v is 10-35 at.%, w is 10-65 at.% y is 10-50 at.%, x is 1-30 at.%, z is 0.1-15 at.%, and x/z is optionally >0.25, wherein substantially none of the fluorine is bonded to the C. A CVD method includes: (a) providing a substrate within a vacuum chamber; (b) introducing into the vacuum chamber gaseous reagents including a **fluorine -providing gas**, an oxygen-providing gas and at least one precursor gas selected from an organosilane and an organosiloxane; and (c) applying energy to the gaseous reagents in the chamber to induce reaction of the gaseous reagents and to form the film on the substrate.

IT **7664-39-3, Hydrogen fluoride**, processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen fluoride (NF3)
(CVD method of **producing** organofluorosilicate glass films having low dielec. const.)

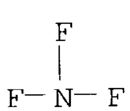
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C23C016-30
ICS C23C016-40; C03C003-062; H01L021-316

CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76

IT 75-76-3, Tetramethylsilane 78-10-4, Tetraethoxysilane 78-62-6, Dimethyldiethoxysilane 353-66-2, Difluorodimethylsilane 358-60-1, Fluorotriethoxysilane 373-74-0, Methyltrifluorosilane 420-56-4, Fluorotrimethylsilane 542-91-6, Diethylsilane 694-53-1, Phenylsilane 766-08-5, Methylphenylsilane 992-94-9, Methylsilane 993-07-7, Trimethylsilane 998-30-1, Triethoxysilane 1111-74-6, Dimethylsilane 1112-39-6, Dimethyldimethoxysilane 1529-17-5, Trimethylphenoxysilane 2031-62-1, Methyldiethoxysilane 2488-01-9, 1,4-Bis(dimethylsilyl)benzene 2551-62-4, Sulfur hexafluoride 2814-79-1, Ethylsilane 4364-07-2 5654-04-6 5833-47-6, 1,1-Dimethyl-1-sila-2-oxacyclohexane 7381-30-8, 1,2-Bis(trimethylsiloxy)ethane 7637-07-2, Boron fluoride (BF3), processes **7664-39-3, Hydrogen fluoride**, processes 7722-84-1, Hydrogen peroxide, processes **7782-41-4, Fluorine, processes** 7782-44-7, Oxygen, processes **7783-54-2, Nitrogen fluoride (NF3)** 7783-60-0, Sulfur fluoride (SF4) 7783-61-1, Silicon fluoride (SiF4) 7787-71-5, Bromine fluoride (BrF3) 7790-91-2, Chlorine fluoride (ClF3) 10024-97-2, Nitrogen oxide (N2O), processes 10028-15-6, Ozone, processes 10102-43-9, Nitrogen oxide (NO), processes 10102-44-0, Nitrogen dioxide, processes 10544-72-6, Nitrogen oxide (N2O4) 13465-71-9 13537-33-2 13637-87-1, Nitrogen chloride fluoride (NClF2) 13824-36-7 14857-34-2, Dimethylethoxysilane 14879-83-5 17082-61-0, 1,2-Bis(trimethylsiloxy)cyclobutene 18139-76-9, Phenoxysilane 18162-96-4, Cyclohexylsilane 18165-85-0, tert-Butylsilane 25711-12-0 476608-55-6
(CVD method of **producing** organofluorosilicate glass films having low dielec. const.)

L31 ANSWER 4 OF 42 HCA

137:359476 Method for **preparing nitrogen trifluoride NF3** by electrolysis and installation therefor. Saab, Waddah; Combel, Michel; Martinez, Eric; Nicolas, Francois (Societe Pour La Conversion De L'Uranium En Metal Et Hexafluorure (Comurhex), Fr.). PCT Int. Appl. WO 2002090620 A2 20021114, 37 pp. DESIGNATED STATES: W: CA, CN, KR, RU, US, ZA; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (French). CODEN: PIXXD2. APPLICATION: WO 2002-FR1546 20020506. PRIORITY: FR 2001-6070 20010507.

AB The invention concerns a method for **prepg. nitrogen trifluoride** by electrolysis comprising NH4F and hydrofluoric acid **HF** (NH4F, xHF) with at least a carbon anode of such quality as to prevent passivation and disintegration thereof or a nickel anode, wherein, when the anode is made of carbon: the electrolytic soln. NH4F, xHF is such that x

ranges between 0.95 and 1.45, that is 34 to 44 % of free **HF**
mass; the temp. of the soln. ranging between 115 and 140.degree.;
the c.d. being 5 to 15 A/dm2; the electrolysis voltage being 5.8 to
9.0 V ; and when the anode is made of nickel: the electrolytic soln.
NH4F, xHF is such that x ranges between 1.4 and 1.6, that is 43 to
46 % of free **HF** mass; the temp. of the soln. between 105
and 125.degree.; the c.d. is between 6 and 12 A/dm2; the
electrolysis voltage between 5.5 and 8.5 V.

IT **7664-39-3, Hydrogen fluoride,** reactions
(app. for **prepg. NF3** by electrolysis of
(NH4)F and **HF** mixt.)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4,** Fluorine, reactions
(formation as byproduct in process of **prepn.** of
NF3 by electrolysis of (NH4)F and **HF** mixt.)

RN 7782-41-4 HCA

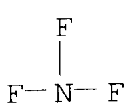
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

IT **7783-54-2P, Nitrogen trifluoride**
(**prepg.** by electrolysis and installation therefor)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C25B

CC 72-9 (Electrochemistry)
Section cross-reference(s): 48, 49, 66

ST **prepg nitrogen trifluoride**
electrolysis impurities adsorption distn

IT Electrolysis
(app. for **prepg. NF3** by)

IT Reactors
(for **prepg. NF3** by electrolysis)

IT Current density
Electric potential
(for **prepg. NF3** by electrolysis of (NH4)F and

HF mixt.)
IT Adsorbents
Cryogenics
Distillation
(use for purifn. of **NF3 prepd.** by electrolysis of (NH4)F and **HF** mixt.)
IT 7440-44-0, Carbon, uses
(anode in electrolyzer for **prepg. NF3** by electrolysis of (NH4)F and **HF** mixt.)
IT 7440-02-0, Nickel, uses
(anode in electrolyzer for **prepg. NF3** by electrolysis of (NH4)F and **HF** mixt. and adsorbent of byproduct impurities)
IT **7664-39-3, Hydrogen fluoride,** reactions
12125-01-8, Ammonium fluoride
(app. for **prepg. NF3** by electrolysis of (NH4)F and **HF** mixt.)
IT 12597-69-2, Steel, uses
(cathode in electrolyzer for **prepg. NF3** by electrolysis of (NH4)F and **HF** mixt.)
IT **7782-41-4,** Fluorine, reactions
(formation as byproduct in process of **prepn.** of **NF3** by electrolysis of (NH4)F and **HF** mixt.)
IT **7783-54-2P, Nitrogen trifluoride**
(**prepg.** by electrolysis and installation therefor)
IT 7429-90-5, Aluminum, reactions
(use as adsorbent of **F2** for purifn. of **NF3 prepd.** by electrolysis of (NH4)F and **HF** mixt.)
IT 7681-49-4, Sodium fluoride, uses
(use as adsorbent of **HF** for purifn. of **NF3 prepd.** by electrolysis of (NH4)F and **HF** mixt.)
IT 7440-50-8, Copper, reactions
(use as adsorbent of byproduct impurities for purifn. of **NF3 prepd.** by electrolysis of (NH4)F and **HF** mixt.)

L31 ANSWER 5 OF 42 HCA COPYRIGHT 2004 ACS on STN
137:240609 Semiconductor devices and fabrication of devices thereof for fine precision patterning. Matsubara, Hirokazu (Hitachi Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002261043 A2 20020913, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-60426 20010305.
AB The title fabrication involves (1) forming on a semiconductor substrate with a material to be etched, (2) providing a mask pattern over the material to be etched, and (3) dry etching the material over the patterned mask with an etchant gas and a polymer-deposition gas so as to remove the material other than masked regions at a condition to deposit the polymer as an etching barrier on the top and sidewall of the mask. The process makes possible for formation

of gate electrodes and patterned circuits in patterning resoln.
.ltoreq.200 nm at high aspect ratio.

IT **7664-39-3, Hydrogen fluoride**, reactions
7782-41-4, Fluorine, reactions **7783-54-2,**
Nitrogen fluoride (**NF3**)
(semiconductor devices and **fabrication** of devices
thereof for fine precision patterning)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
    F
    |
F— N— F
```

IC ICM H01L021-28
ICS H01L021-28; H01L021-3065; H01L021-3213; H01L021-338;
H01L029-812; H01L029-778

CC 76-3 (Electric Phenomena)

IT 74-82-8, Methane, reactions 75-09-2, Methylene chloride, reactions
75-10-5, Difluoromethane 75-46-7, Fluoroform 1333-74-0,
Hydrogen, reactions 7647-01-0, Hydrogen chloride, reactions
7664-39-3, Hydrogen fluoride, reactions
7782-41-4, Fluorine, reactions 7782-50-5, Chlorine,
reactions **7783-54-2, Nitrogen fluoride**
(**NF3**)
(semiconductor devices and **fabrication** of devices
thereof for fine precision patterning)

L31 ANSWER 6 OF 42 HCA COPYRIGHT 2004 ACS on STN
134:303333 Beads of polycrystalline alkali-metal or alkaline-earth metal
fluoride, their preparation and their use. Mayolet, Alexandre;
Pell, Michael (Corning Incorporated, USA). PCT Int. Appl. WO
2001025001 A1 **20010412**, 21 pp. DESIGNATED STATES: W: AE,
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU,
CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL,

IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US26439 20000926. PRIORITY: FR 1999-12386 19991005.

AB The present invention has the following objectives: polycryst. alkali-metal or alk.-earth metal (more particularly CaF2) fluorides, produced in an original form, as beads; said beads having a diam. or equiv. diam. greater than or equal to 100 .mu.m, advantageously between 100 .mu.m and 2 cm and an apparent d. greater than or equal to 60 %, advantageously at least 90 % of the theor. d. of said fluoride; a process for the prepn. (the conditioning) of said fluorides; a process for the prepn. of single crystals of the corresponding alkali-metal or alk.-earth metal fluorides that uses polycryst. fluorides in the aforementioned original form.

IT **7664-39-3, Hydrogen fluoride**, processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen fluoride (
NF3)
(**prepn.** of beads of polycryst. alkali-metal or alk.-earth metal fluoride, carried out under fluorinating atm., intervened by)

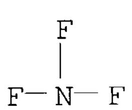
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



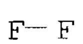
IC ICM B32B005-16
ICS C01B009-08; C01D003-02; C01F005-28
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 73, 74
IT **7664-39-3, Hydrogen fluoride**, processes

7782-41-4, Fluorine, processes
7783-46-2, Lead fluoride (PbF2) **7783-54-2,**
Nitrogen fluoride (NF3) 9002-84-0,
Polytetrafluoroethylene 12125-01-8, Ammonium fluoride (NH4F)
118933-11-2
(**prepn.** of beads of polycryst. alkali-metal or
alk.-earth metal fluoride, carried out under fluorinating atm.,
intervened by)

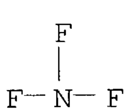
L31 ANSWER 7 OF 42 HCA COPYRIGHT 2004 ACS on STN
134:6607 Apparatus for **manufacture** of **nitrogen**
trifluoride. Tarancon, Gregorio (Florida Scientific
Laboratories Inc., USA). PCT Int. Appl. WO 2000073201 A2
20001207, 47 pp. DESIGNATED STATES: W: AT, AU, BR, CA, CN,
CZ, DE, DK, ES, FI, GB, HU, ID, IL, IS, JP, KP, KR, LU, MX, NO, NZ,
PL, PT, RO, RU, SE, SG, TR, UA, VN; RW: AT, BE, CH, CY, DE, DK, ES,
FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN:
PIXXD2. APPLICATION: WO 1999-US11635 19990526.

AB App. is disclosed for the **manuf.** of **nitrogen**
trifluoride (NF3), starting with an anhyd. molten
flux including ammonia (NH3), a metal fluoride (MF), and
hydrogen fluoride (HF). The app.
includes an electrolyzer, an ammonia solubilizer, a **hydrogen**
fluoride solubilizer, a **nitrogen**
trifluoride reactor, two compressors, two pumps, three
condensers, a gas recycle loop, and two flux loops of the same
component ternary flux, but each loop having a different concn.

IT **7782-41-4**, Fluorine, uses
(app. for **manuf.** of **nitrogen**
trifluoride)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7783-54-2P, Nitrogen trifluoride**
(app. for **manuf.** of **nitrogen**
trifluoride)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3, Hydrogen fluoride,** processes

(app. for **manuf.** of **nitrogen trifluoride**)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IC ICM C01B

CC 49-5 (Industrial Inorganic Chemicals)
Section cross-reference(s): 47

ST app **nitrogen trifluoride manuf**

IT Apparatus
Compressors
Condensers
Electrolytic cells
Gases
Pumps
Reactors
(app. for **manuf.** of **nitrogen trifluoride**)

IT 1333-74-0, Hydrogen, uses 7440-02-0, Nickel, uses
7782-41-4, Fluorine, uses
(app. for **manuf.** of **nitrogen trifluoride**)

IT **7783-54-2P, Nitrogen trifluoride**
(app. for **manuf.** of **nitrogen trifluoride**)

IT **7664-39-3, Hydrogen fluoride,** processes
7664-41-7, Ammonia, processes
(app. for **manuf.** of **nitrogen trifluoride**)

L31 ANSWER 8 OF 42 HCA COPYRIGHT 2004 ACS on STN

133:303837 Manufacture of optical thin film and optical parts involving the film. Suzuki, Yasuyuki; Ando, Kenji; Ohtani, Minoru; Biro, Ryuji; Kanazawa, Hidehiro (Canon Inc., Japan). Jpn. Kokai Tokkyo Koho JP 2000297366 A2 **20001024,** 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-102955 19990409.

AB A metal fluoride thin film with high quality, i.e., low n (.ltoreq.1.45) and no absorption in visible light and UV regions, is formed by sputtering. When, the optical fluoride film, e.g., MgF_2, is formed on a substrate by sputtering a metal target by a **F** -contg. **gas,** H_2O and/or H gas(es) are used in addn. to the **F**-contg. **gas.** Active F is converted into **HF** because of the H_2O layer adsorbed on the substrate, and the residence time of active F on the substrate is prolonged so that F and metal particles from the target react efficiently and that the

optical film with stoichiometry is formed. A d.c. voltage is
supplied to the metal target and a reverse potential is superimposed
to it to prevent generation of an abnormal discharge.

IT **7664-39-3, Hydrogen fluoride,** processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
(**formation** of metal fluoride optical film with
stoichiometry by sputtering using fluorine assocd. with water or
hydrogen)

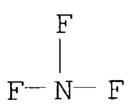
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C23C014-34
ICS G02B001-10; G02B005-08

CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 73

ST metal fluoride optical thin film sputtering; **fluorine
gas** sputtering metal target conversion; **hydrogen
fluoride** formation fluorine water sputtering; stoichiometry
fluoride sputtering **hydrogen fluoride**; low
refractive index optical thin film; visible light absorption optical
thin film; UV absorption optical thin film

IT 1333-74-0, Hydrogen, processes **7664-39-3, Hydrogen
fluoride,** processes 7732-18-5, Water, processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
(**formation** of metal fluoride optical film with
stoichiometry by sputtering using fluorine assocd. with water or
hydrogen)

L31 ANSWER 9 OF 42 HCA

132:57884 Production method of a semiconductor device with dual gate oxide layers.. Kawai, Kenji; Yonekura, Kazumasa (Mitsubishi Denki K.K., Japan). Ger. Offen. DE 19857095 A1 **19991223**, 34 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1998-19857095 19981210. PRIORITY: JP 1998-167160 19980615.

AB A relatively thick gate oxide layer and a relatively thin gate oxide layer are deposited on the surface of a semiconductor. In an area immediately below the thick gate oxide layer, a halogen is added that is confined to a depth of not more than 2 nm from the main surface of the silicon substrate. Accordingly, a semiconductor device can be made with a dual-gate oxide and a prodn. method is described involving the redn. of the damage of the substrate by a simplified procedure.

IT **7664-39-3, Hydrogen fluoride**, processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
(**prodn.** method of a semiconductor device with dual gate oxide layers)

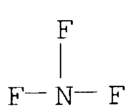
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01L027-088
CC 76-3 (Electric Phenomena)
IT 2551-62-4, Sulfur hexafluoride 7647-01-0, Hydrochloric acid, processes **7664-39-3, Hydrogen fluoride**, processes **7782-41-4, Fluorine, processes** 7782-50-5, Chlorine, processes **7783-54-2, Nitrogen trifluoride** 7790-91-2, Chlorine trifluoride 10294-34-5, Boron trichloride
(**prodn.** method of a semiconductor device with dual gate oxide layers)

L31 ANSWER 10 OF 42 HCA COPYRIGHT 2004 ACS on STN
131:358011 Method for preparing thin films of fluorinated compounds used in optics and thin films thus prepared. Quesnel, Etienne; Robic, Jean Yves; Rolland, Bernard (Commissariat a l'Energie Atomique, Fr.). Fr. Demande FR 2773175 A1 **19990702**, 33 pp. (French). CODEN: FRXXBL. APPLICATION: FR 1997-16793 19971231.

AB The invention concerns a method of prepn. of .gtoreq.1 fluorinated compd. layer under vacuum deposition in which , simultaneously, with the operation of vacuum deposition, one introduces in the gas phase .gtoreq.1 reductive chem. species and **F2**, to realize the fluorination deposit of the fluorinated compd. The invention equally concerns thin layers and multilayers thus prepd. These multilayers on a substrate are able to ensure mirror optical function, spectral filters or antireflection coatings, in the UV-IR spectral domain and play a protective coating role of optical components against intense laser fluxes or against corrosive atmospheres.

IT **7782-41-4DP**, Fluorine, compds., uses
(method for prepg. thin films of fluorinated compds. used in optics and thin films thus prepd.)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7664-39-3, Hydrogen fluoride**, processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
(method for **prepg**. thin films of fluorinated compds. used in optics and thin films thus prepd.)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

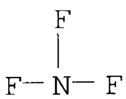
RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

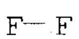


IC ICM C23C016-28
ICS C23C014-06; C23C016-08; C23C016-30; G02B001-10
CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75
IT **7782-41-4DP**, Fluorine, compds., uses 7784-18-1P, Aluminum trifluoride 7789-24-4P, Lithium fluoride, uses 13709-49-4P, Yttrium trifluoride
(method for prepg. thin films of fluorinated compds. used in optics and thin films thus prepd.)
IT 75-73-0, Carbon tetrafluoride 1333-74-0, Hydrogen, processes 2551-62-4, Sulfur hexafluoride **7664-39-3, Hydrogen fluoride**, processes **7782-41-4, Fluorine, processes 7783-54-2, Nitrogen trifluoride** 12125-01-8, Ammonium fluoride 14762-94-8, Atomic **fluorine, processes**
(method for **prepg**. thin films of fluorinated compds. used in optics and thin films thus prepd.)

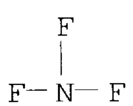
L31 ANSWER 11 OF 42 HCA COPYRIGHT 2004 ACS on STN
131:312145 Reactive matrix for moisture removal from **nitrogen trifluoride** or fluorine. Snow, James T. (Millipore Corporation, USA). PCT Int. Appl. WO 9955620 A1 **19991104**, 12 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US8775 19990421. PRIORITY: US 1998-69432 19980429.
AB Moisture is removed from a **NF3** or **F2** gas by contacting the gas with Al2O3 particles coated with AlF3. The AlF3 is formed by reacting Al2O3 particles with an aq. soln. of **HF**.
IT **7664-39-3, Hydrogen fluoride**, processes
(AlF3-coated alumina particles for moisture removal from **NF3** or **F2**)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4P, Fluorine, processes**
7783-54-2P, Nitrogen trifluoride
(AlF3-coated alumina particles for moisture removal from **NF3** or **F2**)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C01B021-083
CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 49
ST **nitrogen trifluoride** moisture removal AlF3 alumina; fluorine moisture removal AlF3 alumina; aluminum trifluoride moisture removal gas
IT 1344-28-1, Alumina, processes **7664-39-3, Hydrogen fluoride**, processes 7784-18-1, Aluminum trifluoride
(AlF3-coated alumina particles for moisture removal from **NF3** or **F2**)
IT **7782-41-4P, Fluorine, processes**
7783-54-2P, Nitrogen trifluoride
(AlF3-coated alumina particles for moisture removal from **NF3** or **F2**)

L31 ANSWER 12 OF 42 HCA
131:148275 Impact of fluorine from **NF3** based chamber cleaning processes. Brown, Paul Thomas; Mendicino, Laura; Vartanian, Victor (Motorola, Austin, TX, 78721, USA). Proceedings - Electrochemical Society, 99-8(Environmental Issues in the Electronics and Semiconductor Industries), 52-59 (English) **1999**. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.
AB The use and emissions of perfluorocompounds (PFCs) in the semiconductor manufg. industry has received significant attention over the past 5 yr. Focused efforts to evaluate various technologies to reduce these emissions have been underway for the last 3-4 yr. Chamber cleans utilizing **NF3** as the primary

fluorine source have been shown to greatly reduce PFC emissions from the thin films area of a fab. Both in-situ and remote plasma chamber cleaning have been demonstrated by various semiconductor manufg. companies, and both are supported by various industry equipment suppliers. Both techniques will likely play a significant role in long term PFC emissions redn. The dissocn. of **NF3** in the in-situ or remote plasma system leads to formation of various fluorinated reaction byproducts. These byproducts can pose substantial challenges to meeting federal, state, and local limits on emissions of fluoride to the air and to wastewater streams. As **NF3** chamber cleaning proliferates, semiconductor fabs that are already straining to meet low limits on HAP (hazardous air pollutant) emissions to the air and fluoride discharge to the local POTW may face unanticipated capital expenditure requirements to maintain compliance. Based on 25,000 lb or annual **NF3** usage for a typical 200 mm fab, the boundary condition (worst case) air and wastewater impacts are 10.6 TPY and 4.6 mg/l, resp., over current levels. Under most conditions, it is desirable to transfer the fluoride from the air stream to wastewater, thereby diminishing or eliminating the HAPs problem. The increased fluorine contributions to water may be manageable for single fab sites, but will likely require addnl. fluoride treatment infrastructure for multiple fab sites or sites with very low fluoride in wastewater limits. A thorough understanding of the characteristics and quantity of fluoride emissions is imperative to successfully address this challenge.

IT **7664-39-3, Hydrogen fluoride,** occurrence
(emission of; fluorine emissions from **NF3** based chamber cleaning processes)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4D,** Fluorine, compds., occurrence **7783-54-2, Nitrogen fluoride** (NF3)
(fluorine emissions from **NF3** based chamber cleaning processes)

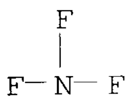
RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 59-2 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 60, 61, 76

ST **fluorine atm** emission **nitrogen fluoride** chamber cleaning semiconductor **manuf;** semiconductor thin film chamber cleaning fluoronitrogen perfluorocompd emission

IT Fluorides, occurrence
(atm. emissions and wastewater discharges of; fluorine emissions from **NF3** based chamber cleaning processes)

IT Air pollution
(control; fluorine emissions from **NF3** based chamber cleaning processes)

IT Wastewater
(fluorides in; fluorine emissions from **NF3** based chamber cleaning processes)

IT Air pollution
Semiconductor materials
(fluorine emissions from **NF3** based chamber cleaning processes)

IT Standards, legal and permissive
(for fluoride atm. emissions and wastewater discharges; fluorine emissions from **NF3** based chamber cleaning processes)

IT Plasma
(remote, chamber cleaning; fluorine emissions from **NF3** based chamber cleaning processes)

IT **7664-39-3, Hydrogen fluoride,** occurrence
7783-61-1, Silicon tetrafluoride
(emission of; fluorine emissions from **NF3** based chamber cleaning processes)

IT **7782-41-4D,** Fluorine, compds., occurrence **7783-54-2 , Nitrogen fluoride** (NF3)
(fluorine emissions from **NF3** based chamber cleaning processes)

L31 ANSWER 13 OF 42 HCA COPYRIGHT 2004 ACS on STN
130:46344 Nitrided oxide film and its manufacture. Saito, Hiroshi (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10321620 A2 **19981204** Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-130599 19970521.

AB In the film, N concn. decreases from the surface part to the depth direction. The film may contain F. The film is manufd. by fluorinating an oxide film with a F compd. and nitriding with a N compd. The film is useful as elec. insulating films in manuf. of

semiconductor integrated circuits. The film showed improved elec. property and high barrier property to B impurity diffusion.

IT **7664-39-3, Hydrogen fluoride**, uses
7782-41-4, Fluorine, uses **7783-54-2**,
Nitrogen trifluoride
(**manuf.** of nitrided oxide elec. insulating film with fluorination)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
   F
   |
F— N— F
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IC ICM H01L021-318
ICS C23C008-02; C23C008-34; H01L021-31
CC 76-10 (Electric Phenomena)
IT 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane 2551-62-4, Sulfur hexafluoride **7664-39-3, Hydrogen fluoride**, uses **7782-41-4**, Fluorine, uses **7783-54-2, Nitrogen trifluoride**
7783-66-6, Iodine pentafluoride 7787-71-5, Bromine trifluoride 7789-30-2, Bromine pentafluoride 7790-89-8, Chlorine fluoride (ClF) 7790-91-2, Chlorine trifluoride 13637-63-3, Chlorine pentafluoride 16921-96-3, Iodine heptafluoride 22520-96-3, Iodine trifluoride 59680-92-1, Bromine fluoride
(**manuf.** of nitrided oxide elec. insulating film with fluorination)

L31 ANSWER 14 OF 42 HCA
130:46201 Production method of semiconductor device.. Yamazaki, Shunpei (Semiconductor Energy Laboratory Co., Ltd. (SEL), Japan). Jpn. Kokai Tokkyo Koho JP 10321526 A2 **19981204** Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-144665 19970519.
AB The title method involves forming an amorphous Si film on a

substrate having an insulator surface by a Hg-sensitized CVD, forming a cryst. Si film using a catalyst for promoting the crystn., and heat treating in an atm. contg. a halogen element to getter the Hg. Specifically, the catalyst may comprise Ni, Fe, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and/or Au, and the atm. may contain HCl, **HF**
, HBr, Cl2, ClF3, BCl3, **NF3**, **F2**, and/or Br2.

IT **7664-39-3, Hydrogen fluoride**, uses
7782-41-4, Fluorine, uses **7783-54-2**,
Nitrogen fluoride (**NF3**)
(semiconductor device **fabrication** by mercury gettering in atm. contg.)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
   F
   |
F— N— F
```

IC ICM H01L021-205
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 74
IT 7647-01-0, Hydrogen chloride, uses **7664-39-3, Hydrogen fluoride**, uses 7726-95-6, Bromine, uses **7782-41-4**, Fluorine, uses 7782-50-5, Chlorine, uses **7783-54-2, Nitrogen fluoride** (
NF3) 7790-91-2, Chlorine fluoride (ClF3) 10035-10-6, Hydrogen bromide, uses 10294-34-5, Boron chloride (BCl3)
(semiconductor device **fabrication** by mercury gettering in atm. contg.)

L31 ANSWER 15 OF 42 HCA COPYRIGHT 2004 ACS on STN
129:128684 Excimer lasers. Clean gases give more power. Bierhals, Juergen; Hamm, Rainer; Schroeder, Georg (Germany). Gas Aktuell, 55, 17-22 (German) **1998**. CODEN: GAAKDX. ISSN: 0340-6067. Publisher: Messer Griesheim GmbH.

AB The influence of the gas quality on the laser efficiency of 2 excimer lasers, a 1 W ArF-laser for medical and a 100 W ArF laser for tech. applications, were investigated. The used gas mixts. contain **F2**/He mixts. with Ne and Ar. The gaseous pollutants (CO2, CF4, SiF4, **HF**) were detd. before and after laser action depending on their residence time. In a gas mixt. that contains N2, the **formation** of **NF3** was also detd.

IT **7782-41-4, Fluorine,** uses
(**gas** quality effect on excimer laser efficiency studied by pollutant detection via IR spectra)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7664-39-3,** Hydrofluoric acid, properties
(gas quality effect on excimer laser efficiency studied by pollutant detection via IR spectra)

RN 7664-39-3 HCA

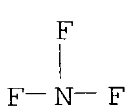
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2, Nitrogen trifluoride**
(gas quality effect on excimer laser efficiency studied by pollutant detection via IR spectra)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses **7782-41-4, Fluorine,** uses
(**gas** quality effect on excimer laser efficiency studied by pollutant detection via IR spectra)

IT 56-23-5, Tetrachloromethane, properties 124-38-9, Carbon dioxide, properties **7664-39-3,** Hydrofluoric acid, properties 10026-04-7, Tetrachlorosilane
(gas quality effect on excimer laser efficiency studied by pollutant detection via IR spectra)

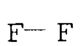
IT **7783-54-2, Nitrogen trifluoride**
(gas quality effect on excimer laser efficiency studied by pollutant detection via IR spectra)

L31 ANSWER 16 OF 42 HCA COPYRIGHT 2004 ACS on STN
129:128237 Electrolyzer. Tarancon, Gregorio (Florida Scientific Laboratories Inc., USA). U.S. US 5779866 A **19980714**, 18 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-757619 19961126.

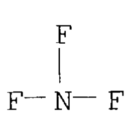
AB An electrolyzer, including a lower electrolyte chamber for receiving liq. electrolyte flux and having disposed therein anode and cathode electrodes for producing anodic and cathodic gases. A first barrier is disposed in the lower electrolyte chamber between the anode and cathode electrodes having a plurality of V-shaped passageways for allowing the passage of electrons but for preventing the recombination of anodic and cathodic gases. The electrolyzer also includes an upper gas chamber having an anodic gas compartment and a cathodic gas compartment for receiving therein the anodic and cathodic gases produced in the lower electrolyte chamber. The upper gas chamber includes a second barrier disposed between the anodic and cathodic gas compartments having no passageways in order to prevent the recombination of anodic and cathodic gases. The second barrier is connected to the first barrier. In addn., the electrolyzer further includes means for transferring the anodic and cathodic gases produced in the anodic and cathodic gas compartments to holding tanks for storing of the anodic and cathodic gases.

IT **7782-41-4P**, Fluorine, preparation **7783-54-2P**, **Nitrogen trifluoride**
(electrolyzer having an upper chamber receiving anodic gas which is an oxidizer gas selecting from **F2**, Cl2, O2, O3, and **NF3**)

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3, Hydrogen fluoride**, uses
(electrolyzer having binary electrolyte flux contg. **HF** and KF)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IC ICM C25B009-00
ICS C25B015-08
NCL 204262000
CC 72-3 (Electrochemistry)
Section cross-reference(s): 49
ST electrolytic cell halogen oxygen ozone prodn; **nitrogen trifluoride prodn**
IT **7782-41-4P**, Fluorine, preparation 7782-44-7P, Oxygen, preparation 7782-50-5P, Chlorine, preparation **7783-54-2P, Nitrogen trifluoride** 10028-15-6P, Ozone, preparation
(electrolyzer having an upper chamber receiving anodic gas which is an oxidizer gas selecting from **F2**, Cl2, O2, O3, and **NF3**)
IT **7664-39-3, Hydrogen fluoride,** uses
7789-23-3, Potassium fluoride
(electrolyzer having binary electrolyte flux contg. **HF** and KF)
IT 7664-41-7, Ammonia, uses
(electrolyzer having ternary electrolyte flux contg. **HF** and KF and NH3)

L31 ANSWER 17 OF 42 HCA
128:7479 RI-MP2. First derivatives and global consistency. Weigend, Florian; Haser, Marco (Institut Physikalische Chemie, Universitat Karlsruhe, Karlsruhe, D-76128, Germany). Theoretical Chemistry Accounts, 97(1-4), 331-340 (English) **1997**. CODEN: TCACFW. ISSN: 1432-881X. Publisher: Springer.
AB The evaluation of RI-MP2 first derivs. with respect to nuclear coordinates or with respect to an external elec. field is described. The prefix RI indicates the use of an approx. resoln. of identity in the Hilbert space of interacting charge distributions (Coulomb metric), i.e., the use of an auxiliary basis set to approx. charge distributions. The RI technique is applied to first derivs. of the MP2 correlation energy expression while the (restricted) Hartree-Fock ref. is treated in the usual way. Computational savings by a factor of 10 over conventional approaches are demonstrated in an application to porphyrin. The RI approxn. to MP2 derivs. does not entail any significant loss in accuracy. Finally, the relative energetic stabilities of a representative sample of closed-shell mols. built from first and second row elements were investigated by the RI-MP2 approach, and thus it is tested whether

such properties that refer to potential energy hypersurfaces in a more global way can be described with similar consistency to the more locally defined derivs.

IT **7664-39-3**, Hydrofluoric acid, properties **7782-41-4**, Fluorine, properties **7783-54-2**, **Nitrogen trifluoride**
(total energy and **formation** energy calcn. by MP2 first derivs. in the RI approxn.)

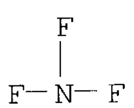
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 65-1 (General Physical Chemistry)
Section cross-reference(s): 22, 67, 69, 76

IT 50-00-0, Formaldehyde, properties 56-23-5, Tetrachloromethane, properties 64-18-6, Formic acid, properties 67-56-1, Methanol, properties 71-43-2, Benzene, properties 74-82-8, Methane, properties 74-84-0, Ethane, properties 74-85-1, Ethene, properties 74-86-2, Ethyne, properties 74-90-8, Hydrocyanic acid, properties 75-15-0, Carbon disulfide, properties 75-73-0, Tetrafluoromethane 101-60-0, Porphyrin 110-02-1, Thiophene 124-38-9, Carbon dioxide, properties 157-16-4, 2H-Azirine 157-39-1, Tetrahedran 302-01-2, Hydrazine, properties 460-12-8, Butadiyne 463-79-6, Carbonic acid, properties 506-63-8, Beryllium dimethyl 630-08-0, Carbon monoxide, properties 1333-74-0, Hydrogen, properties 2053-29-4, Methylimide 2551-62-4, Sulfur hexafluoride 3618-05-1, Diazene 6569-51-3, Borazole 6829-52-3 6914-07-4, Isohydrocyanic acid 7440-41-7, Beryllium, properties 7447-41-8, Lithium chloride, properties 7580-67-8, Lithium hydride 7637-07-2, Boron trifluoride, properties 7647-01-0, Hydrochloric acid, properties 7647-19-0, Phosphorus pentafluoride 7664-38-2, Phosphoric acid, properties

7664-39-3, Hydrofluoric acid, properties 7664-41-7, Ammonia, properties 7664-93-9, Sulfuric acid, properties 7697-37-2, Nitric acid, properties 7722-84-1, Hydrogen peroxide (H2O2), properties 7727-37-9, Nitrogen, properties 7732-18-5, Water, properties **7782-41-4**, Fluorine, properties 7782-50-5, Chlorine, properties 7782-77-6, Nitrous acid 7783-06-4, Hydrogen sulfide, properties 7783-41-7, Oxygen difluoride **7783-54-2, Nitrogen trifluoride** 7783-55-3, Phosphorus trifluoride 7783-60-0, Sulfur tetrafluoride 7787-52-2, Beryllium hydride 7789-24-4, Lithium fluoride, properties 7790-89-8, Chlorine monofluoride 7790-91-2, Chlorine trifluoride 7803-51-2, Phosphine 12057-24-8, Lithium oxide, properties 12057-29-3, Lithium phosphide (Li3P) 12125-01-8, Ammonium fluoride ((NH4)F) 12136-58-2, Lithium sulfide 12185-09-0, Phosphorus, mol (P2), properties 12185-10-3, Phosphorus, mol (P4), properties 12597-10-3, Sulfur, mol (S5), properties 13205-44-2 13283-31-3, Borane, properties 13445-50-6, Phosphorus hydride (P2H4) 13465-07-1, Hydrogen sulfide (H2S2) 13598-22-6, Beryllium sulfide 13774-81-7 13814-25-0, Sulfur difluoride 14332-28-6, Nitroxyl 14452-59-6, Lithium, mol (Li2), properties 16949-15-8, Lithium tetrahydroborate 19287-45-7, Diborane 20500-69-0 20670-26-2 23550-45-0, Sulfur, mol (S2), properties 26134-62-3, Lithium nitride 27174-99-8, Tetraborane(4) 29860-66-0, Beryllium hydride (Be2H4) 41916-72-7, Phosphorus hydride (P2H2) 42851-09-2, Tetrazete 54686-48-5, Beryllium fluoride (Be2F4) 57363-78-7, Lithium, mol (Li8), properties 58500-89-3, Beryllium, mol (Be4), properties 78715-99-8 183199-97-5

(total energy and **formation** energy calcn. by MP2 first derivs. in the RI approxn.)

L31 ANSWER 18 OF 42 HCA

127:25046 **Nitrogen trifluoride** process. Tarancon, Gregorio (Florida Scientific Laboratories, Inc., USA). U.S. US 5628894 A **19970513**, 19 pp. (English). CODEN: USXXAM. APPLICATION: US 1995-544073 19951017.

AB A method for the **prodn.** of **nitrogen trifluoride** (**NF3**) and hydrogen (H2) gas, starting with a molten flux including at least ammonia (NH3), a metal fluoride, and **hydrogen fluoride** (**HF**), including the steps of: circulating the molten flux from an electrolyzer, to an ammonia solubilizer, to a **nitrogen trifluoride** reactor, to a **hydrogen fluoride** solubilizer, and back to the electrolyzer; maintaining the quantity of the molten flux substantially const. by adding ammonia (NH3) and a carrier gas to the ammonia solubilizer and by adding **hydrogen fluoride** (**HF**) and a carrier gas to the **hydrogen fluoride**

solubilizer; producing **fluorine** (F2) **gas**
and hydrogen (H2) gas in the electrolyzer; transferring the carrier
gas from at least one of the solubilizers to the **nitrogen
trifluoride** reactor; mixing the **fluorine
gas** and the carrier gas and supplying the mixed gases to the
nitrogen trifluoride reactor; reacting the
fluorine gas with the molten flux in the
nitrogen trifluoride reactor to **produce
nitrogen trifluoride** (**NF3**); and
collecting the **nitrogen trifluoride** (**NF3**
) **produced** at a **nitrogen trifluoride**
condenser and collecting the hydrogen (H2) produced at a hydrogen
condenser.

IT **7782-41-4**, Fluorine, reactions
(fluorination of NH3 with **F2** in **prodn.** of
nitrogen trifluoride)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

IT **7664-39-3, Hydrogen fluoride,** uses
(fluorination of NH3 with **F2** in **prodn.** of
nitrogen trifluoride in molten flux contg. NH3
and metal fluoride and **HF**)

RN 7664-39-3 HCA

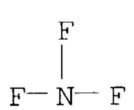
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2P, Nitrogen trifluoride**
(process for **manufg. NF3** using electrolyzer)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C25B001-24
ICS C25B015-08; C01B021-16

NCL 205359000

CC 72-9 (Electrochemistry)
Section cross-reference(s): 49

ST **nitrogen trifluoride** process

IT Fluorination
(fluorination of NH_3 with **F_2** in **prodn.** of **nitrogen trifluoride** in molten flux contg. NH_3 and metal fluoride and **HF**)

IT Fluorides, uses
(fluorination of NH_3 with **F_2** in **prodn.** of **nitrogen trifluoride** in molten flux contg. NH_3 and metal fluoride and **HF**)

IT 7440-01-9, Neon, uses 7440-59-7, Helium, uses
(as carrier gas in **nitrogen trifluoride** process)

IT 1333-74-0P, Hydrogen, **preparation**
(electrolyzer for **producing** **NF_3** and H_2)

IT **7782-41-4**, Fluorine, reactions
(fluorination of NH_3 with **F_2** in **prodn.** of **nitrogen trifluoride**)

IT **7664-39-3, Hydrogen fluoride**, uses
(fluorination of NH_3 with **F_2** in **prodn.** of **nitrogen trifluoride** in molten flux contg. NH_3 and metal fluoride and **HF**)

IT 7664-41-7, Ammonia, reactions
(fluorination of NH_3 with **F_2** in **prodn.** of **nitrogen trifluoride** in molten flux contg. NH_3 and metal fluoride and **HF**)

IT 7789-23-3, Potassium fluoride
(fluorination of NH_3 with **F_2** in **prodn.** of **nitrogen trifluoride** in molten flux contg. NH_3 and potassium fluoride and **HF**)

IT **7783-54-2P, Nitrogen trifluoride**
(process for **manufg.** **NF_3** using electrolyzer)

L31 ANSWER 19 OF 42 HCA COPYRIGHT 2004 ACS on STN
124:274115 Manufacture of optical fibers from fluoride glass. Nishida, Yoshitake; Ooishi, Yasutake; Kanamori, Teruhisa; Terunuma, Yukio; Fujiura, Kazuo; Sudo, Shoichi (Nippon Telegraph & Telephone, Japan). Jpn. Kokai Tokkyo Koho JP 08012363 A2 **19960116** Heisei, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-5184 19950117. PRIORITY: JP 1994-86628 19940425.

AB In the title manuf., which entails (A) forming a composite of a jacket tube retaining a glass rod having higher refractive index (partially) than that of the jacket, (B) heating and rolling the composite to give a mother material, and (C) heating and wire-drawing to form the optical fiber, in step B the internal pressure of the composite is maintained at a neg. value (relative to the external pressure) and He, H, and/or D is introduced into the composite. The fiber may be a fluoride glass. The gas used in step B may contain an inactive **gas** or a **F**-contg. **gas**. Alternately, the title manuf. may entail steps A and

B,as above, followed by (B') inserting the mother material into a 2nd jacket tube to give a 2nd composite, and step C as above, in which He, H, and/or D may be introduced into the composite in step B and/or C. A liq. may be introduced into the composites at the steps in which He, H, and/or D are introduced in the above methods. The liq. may be a macromol., a solder with low m.p., In, or Hg. In the manuf. comprising steps A, B, B', and C, one step of B or C may be performed by the liq. induction, and the other step of them is performed by the gas induction. The optical fiber shows high mech. strength and low loss.

IT **7664-39-3, Hydrogen fluoride,** processes
7782-41-4, Fluorine, processes
7783-54-2, Trifluoroamine
(**manuf.** of optical fibers from fluoride glass)

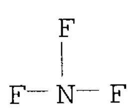
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C03B037-012
ICA G02B006-00
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 57
IT 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane 2551-62-4, Hexafluorosulfur **7664-39-3, Hydrogen fluoride,** processes **7782-41-4, Fluorine, processes 7783-54-2,** Trifluoroamine 13709-36-9, Xenon difluoride
(**manuf.** of optical fibers from fluoride glass)

L31 ANSWER 20 OF 42 HCA COPYRIGHT 2004 ACS on STN
124:189013 Preparation of high-purity anhydrous indium fluoride raw

material for optical fibers. Nishida, Yoshitake; Ooishi, Yasutake; Terunuma, Yukio; Sudo, Shoichi (Nippon Telegraph & Telephone, Japan). Jpn. Kokai Tokkyo Koho JP 07330335 A2 **19951219** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-130570 19940613.

AB The title method involves the following steps: heating an In compd. or metal In with a fluorinating agent to produce anhyd. fluoride; and heating the anhyd. indium fluoride to remove impurities by vaporization to obtain oxide impurity-free InF_3.

IT **7664-39-3, Hydrogen fluoride,** processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
(**prepn.** of high-purity indium fluoride raw material for optical fibers)

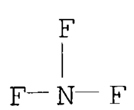
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C01G015-00
ICS C03B037-012; G02B006-00
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 49
IT 75-73-0, Carbon tetrafluoride 1312-43-2, Indium oxide (In_2O_3)
2551-62-4, Sulfur hexafluoride 7440-74-6, Indium, processes
7664-39-3, Hydrogen fluoride, processes
7782-41-4, Fluorine, processes
7783-54-2, Nitrogen trifluoride
12125-01-8, Ammonium fluoride
(**prepn.** of high-purity indium fluoride raw material for optical fibers)

L31 ANSWER 21 OF 42 HCA

117:241582 Binary systems in electrochemical fluorination. I. Sulfamoyl fluoride and hydrazinium(2+) fluoride. Sartori, P.; Lattasch, K. D. (Fachgeb. Anorg. Chem., Univ.-Gesamthochsh.-Duisburg, Duisburg, 4100/1, Germany). Journal of Fluorine Chemistry, 57(1-3), 113-19 (English) **1992**. CODEN: JFLCAR. ISSN: 0022-1139.

AB The effect on the **formation** of **NF3** of H2NSO2F added during the molten-salt electrolysis of ammonium **hydrogen fluoride** was studied with varying amts. of **hydrogen fluoride**. Depending on the conditions of the reaction, the molten fluoride system not only served as solvent and fluorine source for the electrochem. fluorination (ECF) of H2NSO2F, but also as electrolyte. The main **products** were SO2F2, **NF3**, N2 and traces of N2F2. Results from similar expts. with N2H6F2 are described.

IT **7664-39-3, Hydrogen fluoride,** uses
(electrolysis of fluoride melt contg., with hydrazinium fluoride)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4**
(fluorination, electrochem., in binary systems contg. hydrazinium fluoride and sulfamoyl fluoride)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

IT **7783-54-2P, Nitrogen trifluoride**
(**formation** of, in electrolysis of hydrazinium fluoride and sulfamoyl fluoride)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
  F
  |
F—N—F
```

CC 72-2 (Electrochemistry)
Section cross-reference(s): 68, 78

ST fluorination electrochem fluoride molten salt; sulfamoyl fluoride electrolysis nickel electrode; hydrazinium fluoride electrolysis

nitrogen fluoride prodn

IT **7664-39-3, Hydrogen fluoride,** uses
(electrolysis of fluoride melt contg., with hydrazinium fluoride)

IT 14986-54-0, Sulfamoyl fluoride
(electrolysis of, in fluoride medium, **nitrogen fluoride** and sulfur oxide fluoride prodn. in)

IT 13537-45-6
(electrolysis of, in fluoride medium, **nitrogen fluoride prodn.** in)

IT **7782-41-4**
(fluorination, electrochem., in binary systems contg. hydrazinium fluoride and sulfamoyl fluoride)

IT 1333-74-0P, Hydrogen, preparation 7727-37-9P, Nitrogen, preparation **7783-54-2P, Nitrogen trifluoride**
(**formation** of, in electrolysis of hydrazinium fluoride and sulfamoyl fluoride)

L31 ANSWER 22 OF 42 HCA COPYRIGHT 2004 ACS on STN

117:200452 Anodic reaction on nickel in a molten cesium fluoride-ammonium fluoride-**hydrogen fluoride** system. Tasaka, Akimasa; Mizuno, Kazuyoh; Kamata, Akira; Miki, Keiji; Sato, Kazunobu; Teruta, Hirohito; Yanagawa, Katsuya (Dep. Appl. Chem., Doshisha Univ., Kyoto, 602, Japan). Proceedings - Electrochemical Society, 16(Proc. Int. Symp. Molten Salts, 8th, 1992), 564-73 (English) **1992**. CODEN: PESODO. ISSN: 0161-6374.

AB The anodic reaction on Ni was studied at 50-80.degree. using a molten CsF-NH4F-**HF** system. The addn. of CsF into the molten electrolyte reduces the corrosion of the Ni anode. The anodic reaction on Ni varied with increasing potential, permitting division into 4 regions as follows: anodic dissoln. of Ni in region I (0-1 V vs. H2), deposition of a Ni(II) compd. contg. oxide on Ni in region II (1-3 V), oxidn. of Ni(II) film to Ni(III) and/or Ni(IV) compds. in region III (3-5 V), and electrochem. fluorination of NH3 in region IV (more pos. than 5 V). The anode gas was composed of **NF3** and N2 with a small amt. of O2, N2O, difluorodiazene (N2F2), and tetrafluorohydrazine (N2F4).

IT **7664-39-3, Hydrogen fluoride,** uses
(anodic reaction of nickel in molten system contg.)

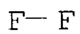
RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

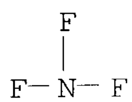
HF

IT **7782-41-4**
(fluorination, electrochem., of ammonia, nickel anodic reaction

in fluoride melt in relation to)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7783-54-2P, Nitrogen trifluoride**
(**formation** of, in anode gas, anodic reaction of nickel
in fluoride melt in relation to)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 56
ST nickel anodic reaction fluoride melt; cesium ammonium
hydrogen fluoride melt nickel; oxidn electrochem
nickel molten fluoride; polarization anodic nickel fluorine melt
IT **7664-39-3, Hydrogen fluoride,** uses
(anodic reaction of nickel in molten system contg.)
IT 7440-02-0, Nickel, reactions
(anodic reaction of, in molten cesium fluoride-ammonium fluoride-
hydrogen fluoride system)
IT **7782-41-4**
(fluorination, electrochem., of ammonia, nickel anodic reaction
in fluoride melt in relation to)
IT 7727-37-9P, Nitrogen, preparation 7782-44-7P, Oxygen, preparation
7783-54-2P, Nitrogen trifluoride
10024-97-2P, Nitrous oxide, preparation 10036-47-2P,
Tetrafluorohydrazine 10578-16-2P, **Nitrogen**
fluoride (N2F2)
(**formation** of, in anode gas, anodic reaction of nickel
in fluoride melt in relation to)

L31 ANSWER 23 OF 42 HCA COPYRIGHT 2004 ACS on STN
117:159540 Electrochemical perfluorination using multicomponent
electrolytes. Sartori, P.; Juenger, C.; Lattasch, K. D.
(Univ.-GH-Duisburg, Germany). DECHEMA Monographien,
125(Elektrochem. Stoffgewinnung: Grundlagen Verfahrenstech.),
233-42 (German) **1992**. CODEN: DMDGAG. ISSN: 0070-315X.
AB The application of an electrochem. perfluorination process (ECF) for
the prodn. of perfluoro compds. contg. functional groups may be
limited due to low soly. of educts, poor cond. of the resulting

electrolyte and/or the formation of dangerous byproducts. The authors try to overcome such obstacles by modifying this method. The use of electrolytes consisting of several compds. not only yields >1 fluorinated product but results in a smoother reaction as well. Examples are the electrolysis of NH4F in **HF** with the addn. of hydrazinium difluoride or sulfamoyl fluoride and the simultaneous prepn. of perfluoro-alkane-sulfonyl fluoride and **NF3** in the ECF of aliph. sulfonamides.

IT **7664-39-3**, Hydrofluoric acid, uses
(ammonium fluoride electrolysis in, with addn. of hydrazinium difluoride or sulfamoyl fluoride)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4**
(fluorination, per-, electrochem., for prodn. of perfluoro compds. contg. functional groups by using multicomponent electrolytes)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7783-54-2P, Nitrogen trifluoride**
(**prepn.** of, simultaneously with perfluoroalkanesulfonyl fluoride, by electrochem. perfluorination of aliph. sulfonamides)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

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  F
  |
F—N—F
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CC 72-4 (Electrochemistry)
Section cross-reference(s): 49
IT Sulfonamides
(aliph., electrochem. perfluorination of, simultaneous prepn. of perfluoroalkanesulfonyl fluoride and **nitrogen trifluoride** from)
IT Sulfonyl fluorides
(alkane, perfluoro, **prepn**. of, simultaneously with **nitrogen trifluoride** by electrochem. perfluorination of aliph. sulfonamides)

IT **7664-39-3**, Hydrofluoric acid, uses
(ammonium fluoride electrolysis in, with addn. of hydrazinium difluoride or sulfamoyl fluoride)

IT **7782-41-4**
(fluorination, per-, electrochem., for prodn. of perfluoro compds. contg. functional groups by using multicomponent electrolytes)

IT **7783-54-2P, Nitrogen trifluoride**
(**prepn.** of, simultaneously with perfluoroalkanesulfonyl fluoride, by electrochem. perfluorination of aliph. sulfonamides)

L31 ANSWER 24 OF 42 HCA COPYRIGHT 2004 ACS on STN

116:115646 A method of forming a corrosion-resistant protective coating on aluminum substrate. Lorimer, D'Arcy H.; Bercaw, Craig A. (Applied Materials, Inc., USA). Eur. Pat. Appl. EP 460701 A1 **19911211**, 9 pp. DESIGNATED STATES: R: DE, FR, GB, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1991-109363 19910607. PRIORITY: US 1990-534807 19900607; US 1990-534796 19900607.

AB The protective coating is formed by contacting an Al oxide layer on an Al substrate with .gtoreq.1 **F**-contg. **gases** at an elevated temp. The Al oxide coating is formed by anodization.

IT **7664-39-3P, Hydrogen fluoride,**
preparation **7782-41-4P**, Fluorine, preparation
7783-54-2P, Nitrogen trifluoride
(**formation** of corrosion-resistant protective coatings by, on aluminum oxide-coated aluminum surfaces)

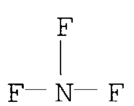
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



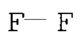
IC ICM C25D011-18
ICS C23C008-10

CC 72-7 (Electrochemistry)
Section cross-reference(s): 56
IT Anodization
(of aluminum surfaces, with subsequent **treatment** with **fluorine**-contg. **gases** for forming corrosion-resistant protective coatings)
IT Corrosion prevention
(on aluminum oxide-coated substrates, with **fluorine** -contg. **gases**)
IT 7429-90-5, Aluminum, miscellaneous
(corrosion-resistant protective coatings on aluminum oxide layers on, with **fluorine**-contg. **gases**)
IT **7664-39-3P, Hydrogen fluoride,** preparation **7782-41-4P,** Fluorine, preparation **7783-54-2P, Nitrogen trifluoride**
75-46-7, Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane
(**formation** of corrosion-resistant protective coatings by, on aluminum oxide-coated aluminum surfaces)
IT 1344-28-1, Aluminum oxide, properties
(on aluminum surfaces, with **fluorine**-contg. **gases,** forming corrosion-resistant protective coatings on)

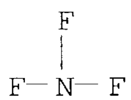
L31 ANSWER 25 OF 42 HCA COPYRIGHT 2004 ACS on STN
116:115645 Corrosion-resistant protective coating on aluminum substrate or surface and method of forming it. Lorimer, D'Arcy H.; Bercaw, Craig A. (Applied Materials, Inc., USA). Eur. Pat. Appl. EP 460700 A1 **19911211,** 9 pp. DESIGNATED STATES: R: DE, FR, GB, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1991-109362 19910607. PRIORITY: US 1990-534796 19900607; US 1990-534807 19900607.
AB The protective coating is formed by contacting an Al oxide layer on an Al surface with .gtoreq.1 **F**-contg. **gases** at an elevated temp. The Al surface is used in a reactor for processing semiconductor wafers.
IT **7664-39-3P, Hydrogen fluoride,** preparation **7782-41-4P,** Fluorine, preparation **7783-54-2P, Nitrogen trifluoride**
(**formation** of corrosion-resistant protective coatings by, on aluminum oxide coated aluminum surfaces)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C25D011-18
 ICS C23C008-10
CC 72-7 (Electrochemistry)
 Section cross-reference(s): 56, 76
IT Anodization
 (of aluminum surfaces, with subsequent **treatment** with **fluorine**-contg. **gases** for forming corrosion-resistant protective coatings)
IT Corrosion prevention
 (on aluminum oxide coated aluminum substrates, with **fluorine**-contg. **gases**)
IT 7429-90-5, Aluminum, miscellaneous
 (corrosion-resistant protective coatings on aluminum oxide layers on, with **fluorine**-contg. **gases**)
IT **7664-39-3P, Hydrogen fluoride**, preparation **7782-41-4P**, Fluorine, preparation **7783-54-2P, Nitrogen trifluoride**
 75-46-7, Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane
 (**formation** of corrosion-resistant protective coatings by, on aluminum oxide coated aluminum surfaces)
IT 1344-28-1, Aluminum oxide, properties
 (on aluminum surfaces, with **fluorine**-contg. **gases**, forming corrosion-resistant protective coatings)

L31 ANSWER 26 OF 42 HCA COPYRIGHT 2004 ACS on STN
116:27130 Removal of **nitrogen trifluoride** from gases containing fluorides and nitrogen oxides. Yasuhara, Yoshiharu (Ebara Sogo Kenkyusho K. K., Japan; Ebara-Infilco Co., Ltd.; Ebara Corp.). Jpn. Kokai Tokkyo Koho JP 03202128 A2 **19910903** Heisei, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1989-338271 19891228.
AB **NF3** is removed from gases contg. **NF3**, fluorides (**HF**, SiF4, **F2**, etc.), and/or N oxides by treatment with adsorbents and allowing residual **NF3** to react with metal-treating agents at .gtoreq.250.degree., where the

fluorides of the metals have a m.p. higher than the reacting temps. **NF_3** is effectively removed without interference of fluorides or nitrogen oxides. Thus, a gas contg. **NF_3** 2, **F_2** 4, NO_2 4, NO 2, and N_2 88 vol.% was treated with $Ca(OH)_2$ and activated C followed by fibrous Fe at .apprx.350.degree.. Contents of **NF_3**, N oxides, fluorides in the gas were reduced to 10, .ltoreq.1, .ltoreq.3 ppm, resp.

IT **7664-39-3**, Hydrofluoric acid, miscellaneous
7782-41-4, **Fluorine**, miscellaneous
(**gases** contg., **nitrogen fluoride** removal from, by adsorption and metal fluoridation)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

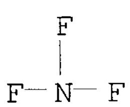
HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

IT **7783-54-2**, **Nitrogen trifluoride**
(removal of, from gases contg. fluorides and/or nitrogen oxides, by adsorption and metal fluoridation)

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF_3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM B01D053-34
ICS B01D053-34
CC 59-4 (Air Pollution and Industrial Hygiene)
ST **nitrogen trifluoride** removal gas fluoride; fluoride nitrogen removal gas; metal fluoridation **nitrogen trifluoride** removal; adsorption **nitrogen trifluoride** gas
IT Molecular sieves
Silica gel, uses
(adsorbent, for **nitrogen fluoride**, for removal from gases contg. fluorides and/or nitrogen oxides)
IT Adsorbents
(for **nitrogen fluoride**, for removal from gases contg. fluorides and/or nitrogen oxides)

IT Fluorides, **preparation**
(**formation** of, in **nitrogen fluoride**
removal from gases)
IT Metallic fibers
(iron, reaction with, of **nitrogen fluoride** in
gases contg. fluorides and/or nitrogen oxides, for removal)
IT 7440-44-0, Carbon, uses
(activated, adsorption with, of **nitrogen**
fluoride, in removal from gases contg. fluorides and/or
nitrogen oxides)
IT 12612-41-8, Hopcalite 1305-78-8, Calcium oxide, uses 1309-42-8,
Magnesium hydroxide 1309-48-4, Magnesium oxide, uses 1313-13-9,
Manganese oxide (MnO_2), uses 1317-38-0, Copper oxide (CuO), uses
1344-28-1, Alumina, uses
(adsorbent, for **nitrogen fluoride**, for
removal from gases contg. fluorides and/or nitrogen oxides)
IT 1305-62-0, Calcium hydroxide, uses
(adsorption with, of **nitrogen fluoride**, in
removal from gases contg. fluorides and/or nitrogen oxides)
IT 7783-61-1, Silicon fluoride (SiF_4) 10102-43-9, Nitrogen oxide
(NO), miscellaneous 10102-44-0, Nitrogen dioxide, miscellaneous
11104-93-1, Nitrogen oxide, miscellaneous
(gases contg., **nitrogen fluoride** removal
from, by adsorption and metal fluoridation)
IT **7664-39-3**, Hydrofluoric acid, miscellaneous
7782-41-4, **Fluorine**, miscellaneous
(**gases** contg., **nitrogen fluoride**
removal from, by adsorption and metal fluoridation)
IT 7439-89-6, Iron, reactions
(reaction with, of **nitrogen fluoride**, for
removal from gases contg. fluorides and/or nitrogen oxides)
IT **7783-54-2**, **Nitrogen trifluoride**
(removal of, from gases contg. fluorides and/or nitrogen oxides,
by adsorption and metal fluoridation)

L31 ANSWER 27 OF 42 HCA COPYRIGHT 2004 ACS on STN
115:169018 Fused salt electrolysis using nickel anode for fluorine
compound preparation. Tasaka, Akimasa; Tateno, Toshio (Morita
Kagaku Kogyo Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 03104891
A2 **19910501** Heisei, 5 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1989-244332 19890919.
AB **F_2** or a F compd. are prepd. by electrolyzing in a fused
salt contg. CsF and **HF** or a raw material using an anode of
a Ni-contg. metal or an insol. element, a diaphragm, and a metal
cathode. **NF_3**, obtained from electrolysis of a NH_4F-CsF-
HF fused salt using a Ni anode, had low CF_4 impurity.
IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous
(fused salt contg., electrolysis of, for fluorine compd. prepn.)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4P**, Fluorine, preparation **7783-54-2P**, **Nitrogen trifluoride**
(**prepn**. of, by fused salt electrolysis, using nickel anode)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
   F
   |
F— N— F
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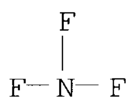
IC ICM C25B001-24
CC 72-5 (Electrochemistry)
ST electrolysis fused salt fluorine prepn; nickel anode electrolysis fused salt; **nitrogen fluoride** electrolysis **prepn**
IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous 12125-01-8, Ammonium fluoride 13400-13-0, Cesium fluoride
(fused salt contg., electrolysis of, for fluorine compd. prepn.)
IT **7782-41-4P**, Fluorine, preparation **7783-54-2P**, **Nitrogen trifluoride**
(**prepn**. of, by fused salt electrolysis, using nickel anode)

L31 ANSWER 28 OF 42 HCA COPYRIGHT 2004 ACS on STN
115:139177 **Nitrogen trifluoride**-based gas mixtures for cleaning. Arai, Hiromichi (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 03146681 A2 **19910621** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1989-283541 19891031.
AB The mixts. comprise **NF3** contg. 0.05-20 vol.% F, Cl and/or **HF**(g). The gas mixts. are used for cleaning sediments on walls and jigs in film-forming processes, e.g., chem.-vapor deposition, sputtering, etc.
IT **7783-54-2, Nitrogen fluoride** (

NF3)
(gas mixts. contg., for cleaning residues in film-forming processes)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous
7782-41-4, Fluorine, uses and miscellaneous
(**nitrogen trifluoride**-based gas mixts. contg., for cleaning residues in film-forming processes)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IC ICM C23F004-00
ICS C01B007-00; C09K013-08; C23C016-44; C23G005-00
CC 49-8 (Industrial Inorganic Chemicals)
Section cross-reference(s): 76
ST **nitrogen trifluoride** cleaning gas compn; fluorine **nitrogen trifluoride** cleaning gas; chlorine **nitrogen trifluoride** cleaning gas; **hydrogen fluoride nitrogen trifluoride** gas
IT Cleaning
(app., of walls in film-**forming, nitrogen trifluoride**-based gas mixts. for)
IT Coating process
(chem.-vapor, app., residue removal from walls in, **nitrogen trifluoride**-based gas mixts. forro)
IT **7783-54-2, Nitrogen fluoride** (
NF3)
(gas mixts. contg., for cleaning residues in film-forming processes)
IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous
7782-41-4, Fluorine, uses and miscellaneous 7782-50-5,

Chlorine, uses and miscellaneous
(**nitrogen trifluoride**-based gas mixts.
contg., for cleaning residues in film-forming processes)

L31 ANSWER 29 OF 42 HCA COPYRIGHT 2004 ACS on STN
114:113476 Electron cyclotron resonance (ECR) plasma etching process and ECR plasma etching apparatus. Mihara, Satoru; Motoyama, Takushi (Fujitsu Ltd., Japan). Eur. Pat. Appl. EP 407169 A2 **19910109**, 9 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1990-307306 19900704. PRIORITY: JP 1989-172524 19890704.

AB An electron cyclotron resonance (ECR) plasma etching process using an ECR etching app. having a plasma generation chamber, and gas supply entrances provided in each chamber, comprises the steps of: directing microwaves into the plasma generation chamber, applying a magnetic field to the plasma generation chamber, and supplying a 1st gas which is used for generating a deposit of a protective film to the reaction chamber. Materials are specified. The side wall parallel to the plasma flow is constantly cleaned.

IT **7664-39-3, Hydrogen fluoride,** uses and miscellaneous
(in generation of protective film in electron cyclotron resonance plasma etching)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4,** Fluorine, uses and miscellaneous
7783-54-2, Nitrogen trifluoride
(plasma **generation** by, in electron cyclotron resonance etching)

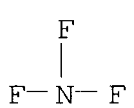
RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



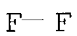
IC ICM H01J037-32

ICS H01L021-311; H01L021-321; H01L021-306
CC 76-11 (Electric Phenomena)
IT 7446-09-5, Sulfur dioxide, uses and miscellaneous 7550-45-0, Titanium tetrachloride, uses and miscellaneous 7647-01-0, Hydrogen chloride, uses and miscellaneous **7664-39-3**, **Hydrogen fluoride**, uses and miscellaneous 7783-61-1, Silicon tetrafluoride 7789-66-4, Silicon tetrabromide 10025-67-9, Disulfur dichloride 10026-04-7, Silicon tetrachloride 10294-34-5, Boron trichloride 10545-99-0, Sulfur chloride (SCl2)
(in generation of protective film in electron cyclotron resonance plasma etching)
IT 124-38-9, Carbon dioxide, uses and miscellaneous 630-08-0, Carbon monoxide, uses and miscellaneous 2551-62-4, Sulfur hexafluoride 7439-90-9, Krypton, uses and miscellaneous 7440-37-1, Argon, uses and miscellaneous 7440-59-7, Helium, uses and miscellaneous 7440-63-3, Xenon, uses and miscellaneous 7726-95-6, Bromine, uses and miscellaneous 7727-37-9, Nitrogen, uses and miscellaneous **7782-41-4**, Fluorine, uses and miscellaneous 7782-44-7, Oxygen, uses and miscellaneous 7782-50-5, Chlorine, uses and miscellaneous **7783-54-2, Nitrogen trifluoride** 10035-10-6, Hydrogen bromide, uses and miscellaneous 10102-43-9, Nitrogen monoxide, uses and miscellaneous 10102-44-0, Nitrogen dioxide, uses and miscellaneous
(plasma **generation** by, in electron cyclotron resonance etching)

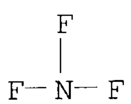
L31 ANSWER 30 OF 42 HCA COPYRIGHT 2004 ACS on STN
112:225396 Current balance of the electrochemical fluorination of a trialkylamine. Dimitrov, A.; Stewig, H.; Ruediger, S.; Kolditz, L. (Cent. Inst. Inorg. Chem., Acad. Sci. GDR, Berlin, 1199, Ger. Dem. Rep.). Journal of Fluorine Chemistry, 47(1), 13-22 (English) **1990**. CODEN: JFLCAR. ISSN: 0022-1139.
AB The electrochem. fluorination of dibutylmethylamine was studied. All the fluorination products formed, liq., gaseous, and dissolved in **HF**, and also the hydrogen evolved were quant. detd. From either their formulae or their relative fluorine contents the amt. of current necessary for their formation was estd. Altogether, the fluorination products detd. cover .apprx.86-92% of the current applied. A major part of the current was consumed by prodn. of polyfluorinated compds., which remained dissolved in the **hydrogen fluoride**.
IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous
(electrochem. fluorination of dibutylmethylamine in)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4**
(fluorination, electrochem., of dibutylmethylamine in hydrofluoric acid)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7783-54-2P, Nitrogen fluoride (NF3)**
(**formation** of, in electrochem. fluorination of dibutylmethylamine in hydrofluoric acid)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 22, 23
IT **7664-39-3,** Hydrofluoric acid, uses and miscellaneous
(electrochem. fluorination of dibutylmethylamine in)
IT **7782-41-4**
(fluorination, electrochem., of dibutylmethylamine in hydrofluoric acid)
IT 75-10-5P, Difluoromethane 75-46-7P, Trifluoromethane 75-73-0P, Tetrafluoromethane 76-16-4P, Hexafluoroethane 76-19-7P, Octafluoropropane 115-25-3P, Octafluorocyclobutane 355-25-9P, Decafluorobutane 514-03-4P, Perfluorodibutylmethylamine **7783-54-2P, Nitrogen fluoride (NF3)**
(**formation** of, in electrochem. fluorination of dibutylmethylamine in hydrofluoric acid)

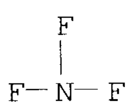
L31 ANSWER 31 OF 42 HCA COPYRIGHT 2004 ACS on STN
112:127726 Electrochemical reaction of ammonium pentafluoroniobate on carbon in molten fluoride. Tasaka, Akimasa; Mimoto, Atsuhisa; Kanetani, Kihei; Kimura, Munehiro; Ohshima, Kinya; Watanabe, Morio (Dep. Appl. Chem., Doshisha Univ., Kyoto, 602, Japan). Science and Engineering Review of Doshisha University, 30(3), 171-80 (Japanese) **1989.** CODEN: DDRKAZ. ISSN: 0036-8172.
AB KF-**HF** bath for **F2** prodn. or KF-**HF**-NH4F bath for **NF3 prodn.** added with (NH4)3NbOF6 (I) (that is converted to (NH4)2NbOF5 in these baths) was electrolyzed

at 120.degree. using amorphous C anode, for the purpose of 1-step synthesis of NbF5. The c.d. in cyclic voltammetry at the potential just before the anodic passivation potential depended on concn. of I, and the soly. of I in these baths was estd. as 1.0 mol %. I showed catalytic action for decompn. of (CF)n on the anode, and neither the low-valence species produced at the cathode reduced (CF)n. No prodn. of NbF5 was found in evolved gas, and the main reaction was probably the cathodic redn. and anodic oxidn. of Nb species paralleling with fluorination of ammonium and pentafluoroniobate ions.

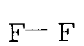
IT **7664-39-3, Hydrogen fluoride,** uses and miscellaneous
(electrochem. reaction of ammonium pentafluoroniobate on carbon in melt of potassium fluoride and)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2P, Nitrogen trifluoride**
(**formation** of, in electrochem. reaction of ammonium pentafluoroniobate on carbon in molten fluoride)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4P,** Fluorine, preparation
(prodn. of, from melt of potassium fluoride and **hydrogen fluoride,** electrochem. reaction of ammonium pentafluoroniobate on carbon in relation to)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



CC 72-5 (Electrochemistry)
IT Electric current
(efficiency of, for hydrogen evolution in potassium fluoride-**hydrogen fluoride**-ammonium fluoride-ammonium pentafluoroniobate system)
IT Electrolytic polarization
(anodic, in ammonium pentafluoroniobate-potassium fluoride-

hydrogen fluoride system)

IT 7447-40-7, Potassium chloride, uses and miscellaneous
(electrochem. reaction of ammonium pentafluoroniobate on carbon in melt of **hydrogen fluoride** and)

IT **7664-39-3, Hydrogen fluoride,** uses and miscellaneous
(electrochem. reaction of ammonium pentafluoroniobate on carbon in melt of potassium fluoride and)

IT 12125-02-9, Ammonium chloride, uses and miscellaneous
(electrochem. reaction of ammonium pentafluoroniobate on carbon in melt of potassium fluoride and **hydrogen fluoride** and)

IT 75-73-0P, Carbon tetrafluoride 7727-37-9P, Nitrogen, preparation 7782-44-7P, Oxygen, preparation **7783-54-2P, Nitrogen trifluoride** 10024-97-2P, Dinitrogen oxide, preparation
(**formation** of, in electrochem. reaction of ammonium pentafluoroniobate on carbon in molten fluoride)

IT 1333-74-0P, Hydrogen, preparation
(formation of, in potassium fluoride-**hydrogen fluoride**-ammonium fluoride-ammonium pentafluoroniobate system, effect of molar fraction of ammonium pentafluoroniobate on current efficiency for)

IT **7782-41-4P,** Fluorine, preparation
(prodn. of, from melt of potassium fluoride and **hydrogen fluoride,** electrochem. reaction of ammonium pentafluoroniobate on carbon in relation to)

L31 ANSWER 32 OF 42 HCA COPYRIGHT 2004 ACS on STN

108:105293 On the existence of pentacoordinated nitrogen. Christe, Karl O.; Wilson, William W.; Schrobilgen, Gary J.; Chirakal, Raman V.; Olah, George A. (Rocketdyne, Canoga Park, CA, 91303, USA). Inorganic Chemistry, 27(5), 789-90 (English) **1988.** CODEN: INOCAJ. ISSN: 0020-1669.

AB The thermal decompn. of NF4HF2 was studied by using 18F-labeled HF2-. The obsd. distribution of 18F among the decompn. products indicates that within exptl. error the attack of HF2- on NF4+ occurs exclusively on F and not on N, contrary to the predictions based on bond polarities. These results confirm the previous suggestion that the lack of pentacoordinated N species is mainly due to steric reasons.

IT **7664-39-3P, Hydrogen fluoride,** preparation **7782-41-4P,** Fluorine, preparation **7783-54-2P, Nitrogen trifluoride**
(**formation** of, in thermal decompn. of tetrafluoroammonium bifluoride)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
  F
  |
F—N—F
```

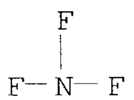
CC 78-9 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 67
IT **7664-39-3P, Hydrogen fluoride,**
preparation **7782-41-4P,** Fluorine, preparation
7783-54-2P, Nitrogen trifluoride
(**formation** of, in thermal decompn. of
tetrafluoroammonium bifluoride)

L31 ANSWER 33 OF 42 HCA
107:25551 Purification of gases for helium-group halide excimer lasers.
Hakuta, Kohzo; Aramaki, Minoru; Suenaga, Takashi (Central Glass Co., Ltd., Japan). Ger. Offen. DE 3632995 A1 **19870402,** 10 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1986-3632995 19860929. PRIORITY: JP 1985-213691 19850928; JP 1986-122206 19860529.
AB Laser gases which comprise a He-group gas, a gas derived from a halogen, and impurities, and which are used as He-group halide excimer lasers, are purified by contacting them with .gtoreq.1 solid, alk. compds., i.e. alkali metal and/or alk. earth compds., to convert active and acid substances to solid metal compds., and then contacting the remaining gas with zeolites to adsorb the residual impurities. Addnl., the halogen-derived gas is a highly oxidizing gas, and the laser gas is contacted with .gtoreq.1 reactive metal to at least convert the highly oxidizing gas to a metal halide prior to the above step of contacting with the alk. compds. A KrF laser gas initially comprising Kr 5, F 0.3, and He 94.7%, after operation for 3 h, contained .apprx.0.2 vol.% F, and the presence of SiF4, **HF**, CF4, H2O, O, and N as impurities was confirmed. Purifn. as described above restored the performance level of the gas to 80% of its initial value.
IT **7782-41-4,** Fluorine, uses and miscellaneous

(excimer laser gases contg., purifn. and regeneration of)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7783-54-2P, Nitrogen trifluoride**
(lasers, excimer, gas purifn. and regeneration for)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3**, Hydrofluoric acid, uses and miscellaneous
(removal of, from helium-group halide gases for excimer lasers)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IC ICM B01D053-00
ICS H01S003-134
ICA B01D053-14; B01D053-02; B01J020-04; B01J020-16; H01S003-045; H01S003-223
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 73
IT 7439-90-9, Krypton, uses and miscellaneous 7440-59-7, Helium, uses and miscellaneous 7440-63-3, Xenon, uses and miscellaneous **7782-41-4**, Fluorine, uses and miscellaneous 7782-50-5, Chlorine, uses and miscellaneous
(excimer laser gases contg., purifn. and regeneration of)
IT **7783-54-2P, Nitrogen trifluoride**
7790-89-8P, Chlorine monofluoride 7790-91-2P, Chlorine trifluoride 13780-38-6P, Xenon chloride 59680-94-3P, Krypton fluoride
(lasers, excimer, gas purifn. and regeneration for)
IT 75-73-0, Carbon tetrafluoride 124-38-9, Carbon dioxide, uses and miscellaneous **7664-39-3**, Hydrofluoric acid, uses and miscellaneous 7727-37-9, Nitrogen, uses and miscellaneous 7782-44-7, Oxygen, uses and miscellaneous 7783-61-1, Silicon tetrafluoride
(removal of, from helium-group halide gases for excimer lasers)

L31 ANSWER 34 OF 42 HCA COPYRIGHT 2004 ACS on STN

106:167299 Oxide film on a silicon substrate. Morita, Mizuho; Hirose, Zenko (Japan). Jpn. Kokai Tokkyo Koho JP 61223177 A2 **19861003** Showa, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-64860 19850328.

AB A method for forming an oxide film having a desired compn. at a low temp. and increased rate involves the following steps: (1) contacting a mixt. of O and F sources to a Si substrate at 0-1300.degree. to prep. a F-contg. or fluorinated oxide film; and (2) contacting the oxide film to H2O or steam source at 0-1300.degree.. Optionally, the F source may be comprised of **NF3**, F, **HF**, or XeF2, and the O source may be comprised of O, N2O, or NO2.

IT **7664-39-3, Hydrogen fluoride**, uses and miscellaneous **7782-41-4**, Fluorine, uses and miscellaneous **7783-54-2, Nitrogen trifluoride**
(in **prepn.** of oxide films on silicon substrates)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
   F
   |
F— N— F
```

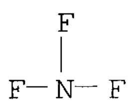
IC ICM C23C008-10
CC 76-3 (Electric Phenomena)
IT **7664-39-3, Hydrogen fluoride**, uses and miscellaneous **7782-41-4**, Fluorine, uses and miscellaneous 7782-44-7, Oxygen, uses and miscellaneous **7783-54-2, Nitrogen trifluoride** 10024-97-2, Nitrous oxide, uses and miscellaneous 10102-44-0, Nitrogen dioxide, uses and miscellaneous 13709-36-9, Xenon difluoride
(in **prepn.** of oxide films on silicon substrates)

L31 ANSWER 35 OF 42 HCA
99:132751 Reactions between ammonium fluoride, hydrazinium(1+) or

hydrazinium(2+) fluoride and some noble gas fluorides. Druzina, B.; Slivnik, J.; Zemva, B. (J. Stefan Inst., Edvard Kardelj Univ., Ljubljana, Yugoslavia). Vestnik Slovenskega Kemijskega Drustva, 30(3), 267-76 (English) **1983**. CODEN: VSKDAA. ISSN: 0560-3110.

AB Reactions between NH4F, N2H5F, N2H6F2 and an excess of XeF2, XeF6 or KrF2 always gave N, **HF** and Xe. In some cases **NF3** was also obtained. Fluorination of hydrazinium fluorides by XeF2 in the presence of metals (M = Fe, Cr) proceeded via the corresponding NH4MF4 as an intermediate compd. This was not the case with XeF6, which is strong enough to fluorinate any transiently formed NH4MF4. KrF2 decompd. before it was able to fluorinate all the reaction products completely and therefore NH4MF4 was also formed in the reaction vessel.

IT **7783-54-2P**
(**formation** of, in reactions of ammonium fluoride or hydrazinium fluorides and noble gas fluorides with or without iron or chromium)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3P**, preparation
(formation of, in reactions of ammonium fluoride or hydrazinium fluorides with noble gas fluorides with or without iron chromium)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4P**, preparation
(formation of, in reactions of ammonium fluoride or hydrazinium fluorides with noble gas fluorides with or without iron or chromium)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

CC 78-9 (Inorganic Chemicals and Reactions)
IT **7783-54-2P**
(**formation** of, in reactions of ammonium fluoride or

hydrazinium fluorides and noble gas fluorides with or without iron or chromium)

IT **7664-39-3P**, preparation
(formation of, in reactions of ammonium fluoride or hydrazinium fluorides with noble gas fluorides with or without iron chromium)

IT 7727-37-9P, preparation **7782-41-4P**, preparation
(formation of, in reactions of ammonium fluoride or hydrazinium fluorides with noble gas fluorides with or without iron or chromium)

L31 ANSWER 36 OF 42 HCA COPYRIGHT 2004 ACS on STN

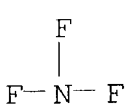
97:205622 **Nitrogen trifluoride-fluorine gas generator** compositions. Christe, Karl O.; Wilson, William W. (United States Dept. of the Army, USA). U. S. Pat. Appl. US 361638 A0 **19820827**, 7 pp. Avail. NTIS Order No. PAT-APPL-6-361 638. (English). CODEN: XAXXAV. APPLICATION: US 1982-361638 19820325.

AB Compns. are described for solid propellant **NF3-F2** gas **generators**, useful in **HF**-DF chem. lasers, using (NF4)2TiF6 and clinkering agents derived from LiF, KF, and NaF, either alone or in mixts. (NF4)2TiF6 forms thermally stable clinkers with the lighter alk. metal fluorides NaF and LiF and less than stoichiometric amts. of these alk. metal fluorides are required for the formation of a stable clinker due to the ability of TiF4 to form polytitanate anions.

IT **7783-54-2**
(**gas generator** of **fluorine** mixt. with, for chem. lasers)

RN 7783-54-2 HCA

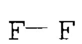
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, uses and miscellaneous
(gas **generator** of **nitrogen trifluoride** mixt. with, for chem. lasers)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3**, uses and miscellaneous
(lasers from deuterium fluoride and, **fluorine-nitrogen trifluoride gas**

generator compns. for)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST **nitrogen fluoride** fluorine **generator** laser; hydrogen deuterium fluoride laser; titanate fluoro gas generator laser
IT Lasers
(chem., deuterium fluoride-**hydrogen fluoride, fluorine-nitrogen trifluoride gas generator** compns. for)
IT 7681-49-4, uses and miscellaneous
(clinkering agents using, for **fluorine-nitrogen trifluoride gas generator** compns. for chem. lasers)
IT 7789-23-3 7789-24-4, uses and miscellaneous 61128-92-5
(clinkering agents using, for **fluorine-nitrogen trifluoride gas generator** compns. for chem. lasers)
IT **7783-54-2**
(**gas generator** of **fluorine** mixt. with, for chem. lasers)
IT **7782-41-4**, uses and miscellaneous
(gas **generator** of **nitrogen trifluoride** mixt. with, for chem. lasers)
IT **7664-39-3**, uses and miscellaneous
(lasers from deuterium fluoride and, **fluorine-nitrogen trifluoride gas generator** compns. for)
IT 14333-26-7
(lasers from **hydrogen fluoride** and, **fluorine-nitrogen trifluoride gas generator** compns. for)

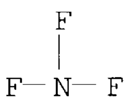
L31 ANSWER 37 OF 42 HCA COPYRIGHT 2004 ACS on STN
91:202072 Self-clinkering burning rate modifier for solid propellant **nitrogen trifluoride-fluorine gas generators** for chemical lasers. Christe, Karl O.; Schack, Carl J. (United States Dept. of the Navy, USA). U.S. US 4163773 **19790807**, 2 pp. (English). CODEN: USXXAM. APPLICATION: US 1978-970775 19781218.
AB $N_2F_3SnF_5$, a self-clinkering $N_2F_3^+$ salt useful as a burning rate modifier for solid propellant **NF_3-F_2** gas

generators for chem. **HF**-DF lasers, was prepd. by
the reaction of N2F3SbF6 with Cs2SnF6 in the presence of **HF**
. N2F3SbF6 was prepd. from SbF5 and N2F4 and was reacted with
Cs2SnF6 to yield N2F3SnF5 which was characterized by 19F NMR and
vibrational spectroscopy.

IT **7783-54-2**
(gas **generating** compns. from fluorine and, for chem.
lasers, self-clinkering burning rate modifier for)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, uses and miscellaneous
(gas **generator** compns. from **nitrogen**
trifluoride and, for chem. lasers, self-clinkering
burning rate modifier for)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

IT **7664-39-3**, uses and miscellaneous
(lasers, self-clinkering burning rate modifier for gas generators
for)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IC C01B021-18

NCL 423351000

CC 73-6 (Spectra by Absorption, Emission, Reflection, or Magnetic
Resonance, and Other Optical Properties)
Section cross-reference(s): 78

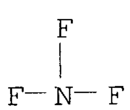
ST **nitrogen fluoride** fluoroantimonate modifier
laser; burning rate modifier laser; antimonate fluoro modifier
laser; fluoride hydrogen deuterium laser

IT Lasers
(deuterium fluoride-**hydrogen fluoride**, gas
generators for, self-clinkering burning rate modifier for)

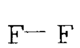
IT **7783-54-2**
(gas **generating** compns. from fluorine and, for chem.

lasers, self-clinkering burning rate modifier for)
IT **7782-41-4**, uses and miscellaneous
(gas **generator** compns. from **nitrogen trifluoride** and, for chem. lasers, self-clinkering burning rate modifier for)
IT **7664-39-3**, uses and miscellaneous 14333-26-7
(lasers, self-clinkering burning rate modifier for gas generators for)
IT 16919-25-8
(reaction of, with **nitrogen fluoride** hexafluoroantimonate)

L31 ANSWER 38 OF 42 HCA COPYRIGHT 2004 ACS on STN
90:79053 Fluorine generator for chemical lasers. Warren, W. R.; et al. (United States Dept. of the Air Force, USA). U. S. Pat. Appl. US 888813 **19781013**, 13 pp. Avail. NTIS. (English). CODEN: XAXXAV. APPLICATION: US 1978-888813 19780321.
AB The storage, handling, and toxicity problems assocd. with the use of **F2** as a reactant for chem. lasers were eliminated by the use of a storable gas supply of **NF3** as a means for generating mol. and/or at. F for use with **HF** or DF continuous-wave or pulsed chain chem. lasers. The high efficiency of pulsed **HF** laser operation at 1 atm pressure was demonstrated. The **NF3** is thermally dissocd. and then cooled to the temp. required for use in the laser immediately prior to injection into the laser plenum.
IT **7783-54-2**
(fluorine **generator**, for chem. lasers)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, uses and miscellaneous
(**generator**, for chem. lasers, **nitrogen trifluoride** as)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3**, uses and miscellaneous
(lasers, **nitrogen trifluoride** as fluorine **generator** for chem.)
RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

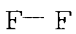
HF

CC 73-6 (Spectra by Absorption, Emission, Reflection, or Magnetic
Resonance, and Other Optical Properties)
ST **nitrogen fluoride** fluorine **generator**
laser; **hydrogen fluoride** laser fluorine
generator
IT Lasers
(chem., **nitrogen trifluoride** as fluorine
generator for)
IT **7783-54-2**
(fluorine **generator**, for chem. lasers)
IT **7782-41-4**, uses and miscellaneous
(**generator**, for chem. lasers, **nitrogen**
trifluoride as)
IT **7664-39-3**, uses and miscellaneous
(lasers, **nitrogen trifluoride** as fluorine
generator for chem.)

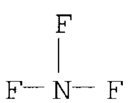
L31 ANSWER 39 OF 42 HCA
88:151825 Ground states of molecules. 40. MNDO results for molecules
containing fluorine. Dewar, Michael J. S.; Rzepa, Henry S. (Dep.
Chem., Univ. Texas, Austin, TX, USA). Journal of the American
Chemical Society, 100(1), 58-67 (English) **1978**. CODEN:
JACSAT. ISSN: 0002-7863.
AB Heats of formation, mol. geometries, 1st ionization potentials and
dipole moments were calcd. by the MNDO (modified neglect of diat.
orbitals) method for F-contg. compds. Major improvement, in
comparison with MNDO/3, is obtained for most properties. The
relative energies of conformational and geometrical isomers agree
with expts., and in some cases the results are superior to those
obtained by ab initio methods. The calcd. properties of the
polyfluoromethane radical cations agree with the obsd. stabilities.
Agreement is also obtained for higher vertical ionization energies,
and particularly for species such as **F2**, where the highest
occupied MO are correctly predicted as .pi.g, .pi.u, and .SIGMA.g+
sym., esp. Calcd. proton and electron affinities agree with exptl.
values. Singlet-triplet sepns. for fluorocarbons and :NF are
discussed.
IT **7664-39-3**, properties **7782-41-4**, properties
7783-54-2
(heat of **formation** of, MO calcn. of)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 22-8 (Physical Organic Chemistry)
Section cross-reference(s): 65
IT 75-02-5 75-10-5 75-37-6 75-38-7 75-46-7 75-73-0 75-89-8
76-05-1, properties 76-16-4 115-25-3 116-14-3, properties
334-99-6 353-36-6 353-50-4 353-85-5 358-95-2 359-11-5
363-72-4 367-11-3 371-62-0 372-18-9 372-38-3 373-64-8
373-91-1 392-56-3 420-26-8 420-46-2 421-50-1 430-64-8
456-22-4 462-06-6 540-36-3 557-99-3 593-53-3 624-72-6
675-14-9 684-16-2 693-85-6 697-11-0 700-16-3 753-58-2
814-73-3 931-91-9 1493-02-3 1495-50-7 1630-77-9 1630-78-0
2264-21-3 2670-13-5 2713-09-9 3248-58-6 3744-07-8
3744-29-4 7127-18-6 7637-07-2, properties **7664-39-3**,
properties **7782-41-4**, properties 7783-41-7
7783-54-2 7789-25-5 7789-26-6 10022-50-1 10036-47-2
10405-27-3 12061-70-0 12355-90-7 13453-52-6 13703-95-2
13709-83-6 13774-92-0D, fluorinated derivs. 13776-62-0
13779-24-3 13812-43-6 13842-55-2 13847-65-9 13867-66-8
13965-73-6 13967-06-1 14034-79-8 14984-90-8 15499-23-7
18238-55-6 18851-76-8 23361-56-0 23728-64-5 26202-31-3
29526-61-2 29526-62-3 31685-31-1 35310-31-7 35398-31-3
37366-64-6 38607-35-1 39819-67-5 40640-67-3 50673-31-9
54128-17-5 57449-71-5 57449-72-6 59012-17-8 59012-18-9
59122-96-2 64881-36-3 66177-07-9 66177-08-0
(heat of **formation** of, MO calcn. of)

L31 ANSWER 40 OF 42 HCA COPYRIGHT 2004 ACS on STN
87:209265 Solid gas generators for chemical lasers. Bowen, R. E.; Pisacane, F. J.; Barber, W. H.; Dengel, O. H.; Robb, R. A. (White Oak Lab., Nav. Surf. Weapons Cent., Silver Spring, MD, USA). U. S. NTIS, AD Rep., AD-A042674, 16 pp. Avail. NTIS From: Gov. Rep. Announce. Index (U. S.) 1977, 77(21), 227 (English) **1976**.

CODEN: XADRCH.

AB Solid gas generator formulations which produce H2, D2, and a mixt. of **F2** and **NF3** were developed for **HF**/DF chem.lasers. NF4BF4 was chosen as the oxidizer candidate for the **F2/NF3** solid gas **generator.** A continuous reaction for the phytolytic prodn. of NF4BF4 was designed and assembled. A prodn. rate of 5 g in one h of pure NF4BF4 was achieved. The **F2/NF3** solid gas **generator** formulation NF4BF4/KF/Sn was selected for furher evaluation. Burning rates of the order of .08 cm/s and yields of .apprx.34 wt.% available F were realized. Pressed pellets exhibited excellent mech. and safety characteristics. A mixt. of LiAlD4 and ND4Cl was selected, characterized and test fired at the 1500 g level at a burning rate of 0.064 cm/s. A point design concept for a P2/ **NF3** fuel system was developed incorporating existing laser and gas generator technol.

IT **7664-39-3**, uses and miscellaneous
(chem. laser, solid gas generator for)

RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4P**, preparation **7783-54-2P**
(**generation** of hydrogen and, for chem. lasers)

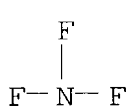
RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 73-6 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance, and Other Optical Properties)

ST **hydrogen fluoride** chem laser; deuterium fluoride chem laser; solid gas generator laser

IT **7664-39-3**, uses and miscellaneous
(chem. laser, solid gas generator for)

IT **7782-41-4P**, preparation **7783-54-2P**
(**generation** of hydrogen and, for chem. lasers)

L31 ANSWER 41 OF 42 HCA COPYRIGHT 2004 ACS on STN
65:36195 Original Reference No. 65:6709c-e The synthesis of the perfluoroammonium cation, NF4+. Tolberg, W. E.; Rewick, R. T.; Stringham, R. S.; Hill, M. E. (Stanford Res. Insts., Menlo Park, CA). Inorg. Nucl. Chem. Letters, 2(3), 79-82 (English) **1966**
.

AB The ion was synthesized in the form of its salt, NF4SbF6, and included studies of the system **NF3/F2**/SbF5/ **HF** and its 6 binary and 4 ternary sub-systems. The synthesis occurred when equimolar quantities of **NF3**, F, and SbF5 were heated in a Monel tube reactor for .apprx.2.5 days at 200.degree. and at pressures up to 85 atm. A liquid phase of **HF** and SbF5 was present at a concn. of 0.2 mole fraction of SbF5 relative to **HF** at room temp. Upon completion of the reaction and analyses of unreacted starting materials, the solids exhibited a vapor pressure not in excess of a few .mu. at 200.degree.. The product was decompd. at 350.degree. in vacuo, yielding .apprx.0.01 mole of gas contg. equimolar quantities of NH3 and F. The consumption of **NF3**, F, and SbF5 was best accounted for by the formation of NF4SbF6 along with Ni++ and Cu++ hexafluoroantimonates. More than 40% of the **NF3** charged is converted to a solid. The crude product contains .apprx.0.035 mole of NF4SbF6 and is .apprx.75% pure by wt., which was characterized without further purification by means of thermal decompn., hydrolysis, and 19F N.M.R. spectra. Above 300.degree., thermal decompn. proceeded as: NF4SbF6 .fwdarw. **NF3** + **F2** + SbF5, and the hydrolysis was: NF4SbF6 + 7H2O .fwdarw. **NF3** + H2O2 + HSb(OH)6 + 7 **HF**. The N.M.R. spectra of the **HF** soln. of the product contained a triplet resonance, centered at -214. 7ppm. from FCCl3. The lines were equally intense with a coupling const., JN-F of 231 cycles/sec. The chem. shift and splitting differ from any known N-F species. The salt, NF4AsF6 was synthesized similarly, and the product decompd. at 300.degree. to yield **NF3**, F, and AsF5.

IT **7782-41-4**, Fluorine.
(nuclear magnetic resonance of, in NF4[SbF6])

RN 7782-41-4 HCA

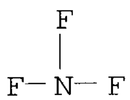
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

(reaction with SbF5, **HF** and **NF3**, NF4[SbF6]
formation in

IT **7783-54-2, Nitrogen fluoride,**
NF3
(reaction with SbF5, fluorine and **HF**, NF4[SbF6]

formation in)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7664-39-3**, Hydrofluoric acid
(reactions of, with SbF5, fluorine and **NF3**, NF4[SbF6]
formation in)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

CC 14 (Inorganic Chemicals and Reactions)
IT **7782-41-4**, Fluorine.
(nuclear magnetic resonance of, in NF4[SbF6])
IT 7783-70-2, Antimony fluoride, SbF5
(reaction with F, **HF** and **NF3**, NF4[SbF6]
formation in)
IT **7782-41-4**, Fluorine.
(reaction with SbF5, **HF** and **NF3**, NF4[SbF6]
formation in)
IT **7783-54-2, Nitrogen fluoride,**
NF3
(reaction with SbF5, fluorine and **HF**, NF4[SbF6]
formation in)
IT **7664-39-3**, Hydrofluoric acid
(reactions of, with SbF5, fluorine and **NF3**, NF4[SbF6]
formation in)

L31 ANSWER 42 OF 42 HCA
54:21104 Original Reference No. 54:4134g-i Heat of **formation**
of **nitrogen trifluoride** and the N-F bond energy.
Armstrong, Geo. T.; Marantz, Sidney; Coyle, Charles F. (Natl. Bur.
of Standards, Washington, DC). Journal of the American Chemical
Society, 81, 3798 (Unavailable) **1959**. CODEN: JACSAT.
ISSN: 0002-7863.
AB The heats of the reaction .delta.H for **NF3**(g) + 3/2H2(g) =
1/2N2(g) + 3HF(aq., a = 1) (1) and **NF3**(g) + 4NH3(g) =
3NH4F(c) + N2(g) (2) were detd. calorimetrically, and reasonably
concordant values for the heat of **formation** .delta.
Hf of **NF3** were derived. For reaction 1 the mean
value of .delta.H.degree.25 (kj./mole) was -859.0 .+-. 13.4 or

-205.3 .+-. 3.2 kcal./mole and .DELTA.**Hf**.degree.25 (
NF3) kcal./mole was -30.7 .+-. 3.4. For reaction 2 the
corresponding av. values were -1085.7 .+-. 4.2, -259.5 .+-. 1.0, and
-29.4 .+-. 2.1. With E(F-F) = 37.7 .+-. 1 kcal./mole and
E(N.tplbond.N) = 225.92 .+-. 0.1 kcal./mole, the mean N-F bond
energy E(N-F) in the **NF3** mol. is 66.4 .+-. 0.8 kcal./mole.
The dissocn. energies of the individual bonds are estd. to be at
25.degree. D(NF2-F) = 74.0; D(NF-F) = 62.6; D(N-F) = 62.6
kcal./mole.

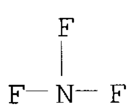
IT **7782-41-4,** Fluorine
(bonds of, with N in **NF3,** energy of)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7664-39-3,** Hydrofluoric acid
(**formation** of, in **NF3** reaction with H)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2, Nitrogen fluoride,**
NF3
(heat of **formation** of)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 2 (General and Physical Chemistry)
IT Bonds
(energy or strength of, of F with N, in **NF3**)
IT Heat of dissociation
Heat of **formation**
(of **nitrogen trifluoride**)
IT Heat of reaction
(of **nitrogen trifluoride** with NH3 and H)
IT 7727-37-9, Nitrogen
(bonds of, with F, energy of, in **NF3**)
IT **7782-41-4,** Fluorine
(bonds of, with N in **NF3,** energy of)

IT 12125-01-8, Ammonium fluoride, NH4F
(formation of, from NH3 reaction with **NF3**)
IT **7664-39-3**, Hydrofluoric acid
(**formation** of, in **NF3** reaction with H)
IT **7783-54-2, Nitrogen fluoride,**
NF3
(heat of **formation** of)
IT 1333-74-0, Hydrogen
(reaction of, with **NF3**)
IT 7664-41-7, Ammonia
(reactions of, with **NF3**)

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L32 ANSWER 1 OF 26 HCA COPYRIGHT 2004 ACS on STN
138:116409 Semiconductor fabrication apparatus and its cleaning.
Nakahara, Miwako; Arai, Toshiyuki; Yamamoto, Satoshi; Ooka, Tsukasa;
Sano, Atsushi; Itaya, Shuji; Sakuma, Harunobu (Hitachi Ltd., Japan;
Hitachi Kokusai Electric Inc.). Jpn. Kokai Tokkyo Koho JP
2003027240 A2 20030129, 13 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2001-220834 20010723.
AB In a semiconductor fabrication app. having a treatment chamber, a
movable substrate holder, and device for supplying a treatment gas,
first and second devices for supplying cleaning gases are used to
remove a film, such as Ru, Ru oxide, Os, or Os oxide, deposited on
the app. at an increased speed.
IT **7664-39-3, Hydrogen fluoride**, uses
7782-41-4, Fluorine, uses
(semiconductor **fabrication** app. and its cleaning)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IC ICM C23C016-44
ICS H01L021-205; H01L021-285; H01L021-3065
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 47, 75
IT 7647-01-0, Hydrogen chloride, uses **7664-39-3**,
Hydrogen fluoride, uses 7726-95-6, Bromine, uses

7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses
7782-50-5, Chlorine, uses 10035-10-6, Hydrogen bromide, uses
57158-31-3, Chlorine fluoride 186958-04-3, **Nitrogen fluoride**
(semiconductor **fabrication** app. and its cleaning)

L32 ANSWER 2 OF 26 HCA COPYRIGHT 2004 ACS on STN
137:22055 Method and apparatus for **manufacture** of **nitrogen trifluoride.** Satchell, Donald Prentice, Jr.; Le Roux, Johannes Petrus (The BOC Group, Inc., USA; The South African Nuclear Energy Corporation Limited). Eur. Pat. Appl. EP 1215169 A1 20020619, 16 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2001-650148 20011213. PRIORITY: US 2000-737191 20001214.

AB The invention provides a method and app. for the **manuf.** of **nitrogen trifluoride.** The method comprises contacting a **fluorine**-contg. feed **stream** with liq. ammonium acid fluoride in a reaction zone for time and under conditions sufficient to **produce nitrogen trifluoride.** During the contacting step, the effective melt acidity value of the liq. ammonium acid fluoride is decreased and a reaction product stream is removed. In one embodiment, a gaseous mixt. of elemental fluorine and **hydrogen fluoride** is contacted with a bulk liq. ammonium acid fluoride, such that the initial effective melt acidity value is greater than the melt acidity value of the bulk liq. ammonium acid fluoride in the reaction zone.

IT **7664-39-3, Hydrogen fluoride,** reactions
(method and app. for **manuf.** of **nitrogen trifluoride**)

RN 7664-39-3 HCA

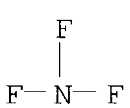
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2P, Nitrogen trifluoride**
(method and app. for **manuf.** of **nitrogen trifluoride**)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

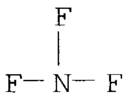


IC ICM C01B021-083
CC 49-8 (Industrial Inorganic Chemicals)
ST **nitrogen trifluoride manuf**
IT Reactors
(method and app. for **manuf.** of **nitrogen trifluoride**)
IT 1341-49-7, Ammonium **hydrogen fluoride**
7664-39-3, Hydrogen fluoride, reactions
7664-41-7, Ammonia, reactions
(method and app. for **manuf.** of **nitrogen trifluoride**)
IT **7783-54-2P, Nitrogen trifluoride**
(method and app. for **manuf.** of **nitrogen trifluoride**)

L32 ANSWER 3 OF 26 HCA COPYRIGHT 2004 ACS on STN
136:176436 Method of producing doped polysilicon layers and polysilicon layered structures, and method of structuring layers, and layered structures which comprise polysilicon layers. Dreybrodt, Joerg; Drescher, Dirk; Zedlitz, Ralf; Wege, Stephan (Germany). U.S. Pat. Appl. Publ. US 20020016044 A1 20020207, 18 pp., Cont.-in-part of U.S. Ser. No. 26,659, abandoned. (English). CODEN: USXXCO. APPLICATION: US 2001-884188 20010619. PRIORITY: DE 1997-19706783 19970220; US 1998-26659 19980220.
AB Doped polysilicon layers and layered polysilicon structures are produced, and the layers and layered structures are structured. The doping is distinguished by the fact that the doping compd. is added as a process gas during the CVD of the polysilicon to define the doping profile. The feed of dopant to the process gas is stopped toward the end of the vapor deposition, with the result that a boundary layer of undoped Si is deposited. As a result, a favorable surface quality and better adhesion to a neighboring layer is obtained. The structuring process comprises an .gtoreq.3-step etching process in which a **F** contg. **gas** is used for etching in a 1st step, a Cl-contg. gas is used for etching in a 2nd step and a Br-contg. gas is used for etching in a 3rd step. The invention also encompasses wafers and semiconductor chips produced with the novel doping and/or structuring method.
IT **7664-39-3,** Hydrofluoric acid, processes **7783-54-2, Nitrogen trifluoride**
(etchant; method of **producing** doped polysilicon layers and polysilicon layered structures, and method of structuring layers, and layered structures which comprise polysilicon layers)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

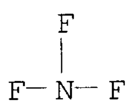


IC ICM H01L021-336
NCL 438305000
CC 76-3 (Electric Phenomena)
IT 2551-62-4, Sulfur hexafluoride 7440-59-7, Helium, processes
7647-01-0, Hydrogen chloride, processes **7664-39-3,**
Hydrofluoric acid, processes 7782-44-7, Oxygen, processes
7782-50-5, Chlorine, processes **7783-54-2, Nitrogen**
trifluoride 10035-10-6, Hydrogen bromide, processes
10294-34-5, Boron trichloride
(etchant; method of **producing** doped polysilicon layers
and polysilicon layered structures, and method of structuring
layers, and layered structures which comprise polysilicon layers)

L32 ANSWER 4 OF 26 HCA COPYRIGHT 2004 ACS on STN
134:371147 Apparatus and method for treating industrial flue
gases containing **fluorine** compounds. Mori,
Yoichi; Kyotani, Keiji; Shinohara, Toyoji (Ebara Corp., Japan).
Jpn. Kokai Tokkyo Koho JP 2001137659 A2 **20010522**, 6 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-328411 19991118.
AB The title app. comprises means for passing flue **gases**
contg. **F** compds. (e.g., C2F6, C3F8, SF6 or **NF3**)
from semiconductor **manufg.** plants through a filter to sep.
flue dust, means for adding the gases with H2, H2O, and/or O2, means
for reacting the mixed gases over .gamma.-alumina catalysts at
600-900.degree. in a pyrolysis reactor to decomp. the F compds.,
means for adjusting the pressure of treated gases in an air ejector,
means for monitoring the gas concn. in a FT-IR analyzer, and means
for sepg. acidic pollutants (e.g., **HF**, SiCl4 or COF2) and
CO from the pyrolyzed gases in a wet scrubbing tower.
IT **7664-39-3, Hydrogen fluoride**, processes
7783-54-2, Nitrogen trifluoride
(app. and method for treating industrial flue **gases**
contg. **fluorine** compds. by pyrolysis and wet scrubbing)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM B01D053-70
ICS B01D053-34; B01D053-86; B01J021-04
CC 59-4 (Air Pollution and Industrial Hygiene)
ST industrial flue **gas fluorine** compd pyrolysis scrubbing; alumina catalyst flue gas fluorohydrocarbon decompn filter
IT Hydrocarbons, processes
(fluoro; app. and method for treating industrial flue **gases** contg. **fluorine** compds. by pyrolysis and wet scrubbing)
IT Flue gases
(industrial flue gases; app. and method for treating industrial flue **gases** contg. **fluorine** compds. by pyrolysis and wet scrubbing)
IT 75-46-7, Trifluoromethane 76-16-4, Perfluoroethane 76-19-7, Perfluoropropane 353-50-4, Carbonyl difluoride 630-08-0, Carbon monoxide, processes 2551-62-4, Sulfur hexafluoride
7664-39-3, Hydrogen fluoride, processes
7783-54-2, Nitrogen trifluoride
10026-04-7, Silicon tetrachloride
(app. and method for treating industrial flue **gases** contg. **fluorine** compds. by pyrolysis and wet scrubbing)
IT 1344-28-1, Alumina, uses
(.gamma.-, catalysts; app. and method for treating industrial flue **gases** contg. **fluorine** compds. by pyrolysis and wet scrubbing)

L32 ANSWER 5 OF 26 HCA COPYRIGHT 2004 ACS on STN
129:126455 **Treatment** of **fluorine** compound-containing flue gases. Sugano, Shuichi; Arato, Toshiaki; Ikeda, Nobumitsu; Yasuda, Takeshi; Yamashita, Toshio; Azuhata, Shigeru; Tamada, Shin (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10192653 A2 **19980728** Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-4349 19970114.
AB The title process comprises conversion of noxious F compds. contg. .gtoreq.2 C, and optionally N in flue gases into **HF** by reacting over decompn. catalysts contg. Al2O3, TiO2, SiO2, and/or ZrO2 at 400-800.degree. under excess steam atm. The catalyst may contain Si, Mg, Zr, W, Sn, Ce, Mn, Bi, and/or Ni. The catalyst may also contain 75-98 wt.% Al2O3 and 2-25 wt.% TiO2. The process is

useful for decompn. of F compds. such as C2F6 and **NF3** from
semiconductor **manufg.** industry.

IT **7664-39-3, Hydrogen fluoride**, formation
(nonpreparative)
(catalytic treatment of flue **gases** contg.
fluorine compds. from semiconductor manufg.)

RN 7664-39-3 HCA

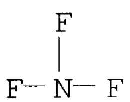
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2, Nitrogen trifluoride**
(catalytic treatment of flue **gases** contg.
fluorine compds. from semiconductor manufg.)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM B01D053-86
ICS A62D003-00; B01J021-04; B01J021-06; B01J021-08

CC 59-6 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67, 76

ST fluorohydrocarbon decompn flue gas catalyst; **nitrogen**
fluoride decompn catalyst alumina; semiconductor flue gas
fluoride decompn catalyst

IT Flue gases
Steam
(catalytic treatment of flue **gases** contg.
fluorine compds. from semiconductor manufg.)

IT Perfluoro compounds
(catalytic treatment of flue **gases** contg.
fluorine compds. from semiconductor manufg.)

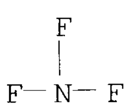
IT Decomposition catalysts
(for treatment of flue **gases** contg. **fluorine**
compds. from semiconductor manufg.)

IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9,
Silica, uses 13463-67-7, Titania, uses
(catalytic treatment of flue **gases** contg.
fluorine compds. from semiconductor manufg.)

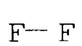
IT **7664-39-3, Hydrogen fluoride**, formation
(nonpreparative)
(catalytic treatment of flue **gases** contg.
fluorine compds. from semiconductor manufg.)

IT 76-16-4, Hexafluoroethane **7783-54-2, Nitrogen trifluoride**
(catalytic treatment of flue **gases** contg. **fluorine** compds. from semiconductor manufg.)
IT 1303-86-2, Boron oxide, uses 1304-76-3, Bismuth oxide (Bi2O3), uses 1306-38-3, Ceria, uses 1309-48-4, Magnesia, uses 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide, uses 1314-35-8, Tungsten oxide (WO3), uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-02-0, Nickel, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-33-7, Tungsten, uses 7440-42-8, Boron, uses 7440-45-1, Cerium, uses 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7723-14-0, Phosphorus, uses 18282-10-5, Tin oxide (SnO2)
(decompn. catalysts contg.; for treatment of flue **gases** contg. **fluorine** compds. from semiconductor manufg.)

L32 ANSWER 6 OF 26 HCA COPYRIGHT 2004 ACS on STN
127:83493 Process for **nitrogen trifluoride synthesis**. Coronell, Daniel G.; Hsiung, Thomas H.L.; Withers, Howard P., Jr.; Woytek, Andrew J. (Air Products and Chemicals, Inc., USA). U.S. US 5637285 A **19970610**, 14 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-593779 19960130.
AB **Nitrogen trifluoride** is **synthesized** from elemental **fluorine gas** and a source of ammonia having a formula NH4Hx-1Fx where x is .gtoreq.2.55 through a gas-liq. phase reaction by input of power to the mixing means of .gtoreq.1000 W/m3 on the basis of a flat blade turbine.
IT **7783-54-2P, Nitrogen trifluoride**
(process for **nitrogen trifluoride synthesis**)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

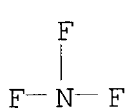


IT **7782-41-4, Fluorine**, reactions
(**process** for **nitrogen trifluoride synthesis**)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IC ICM C01B021-06
NCL 423406000
CC 49-8 (Industrial Inorganic Chemicals)
ST **nitrogen trifluoride synthesis**
fluorine ammonia reaction
IT **7783-54-2P, Nitrogen trifluoride**
(process for **nitrogen trifluoride synthesis**)
IT 506-87-6, Ammonium carbonate 1341-49-7, Ammonium **hydrogen fluoride** 6484-52-2, Ammonium nitrate, reactions 7664-41-7, Ammonia, reactions **7782-41-4, Fluorine**, reactions 7783-20-2, Ammonium sulfate, reactions 12027-06-4, Ammonium iodide 12124-97-9, Ammonium bromide 12125-01-8, Ammonium fluoride 12125-02-9, Ammonium chloride, reactions
(**process** for **nitrogen trifluoride synthesis**)

L32 ANSWER 7 OF 26 HCA COPYRIGHT 2004 ACS on STN
124:236439 Purification of **nitrogen trifluoride**.
Morikawa, Fumihiro; Hirai, Eiichi (Nissan Chemical Ind Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 07330316 A2 **19951219** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-119838 19940601.
AB The purifn. process comprises preliminary removal of impurities of **F2**, OF2, and **HF**, and passing through activated C. The activated C may be impregnated with water. The process removes N2F2 and N2F4 completely.
IT **7783-54-2P, Nitrogen trifluoride**
(purifn. of **nitrogen trifluoride**)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C01B021-083
CC 49-8 (Industrial Inorganic Chemicals)
ST **nitrogen trifluoride** purifn
IT 7440-44-0, Carbon, processes
(activated; in purifn. of **nitrogen trifluoride**)
IT **7783-54-2P, Nitrogen trifluoride**
(purifn. of **nitrogen trifluoride**)

L32 ANSWER 8 OF 26 HCA COPYRIGHT 2004 ACS on STN
123:72595 Preparation of hemispherical grain (HSG) silicon using a

fluorine-based **gas** mixture and high vacuum anneal.
Thakur, Randhir P. S. (Micron Semiconductor, Inc., USA). U.S. US 5407534 A **19950418**, 9 pp. (English). CODEN: USXXAM.
APPLICATION: US 1993-166058 19931210.

AB The present invention develops a process for forming hemispherical grained Si storage capacitor plates by the steps of: forming a Si layer over a pair of neighboring parallel conductive lines, the Si layer making contact to an underlying conductive region; patterning the Si layer to form individual Si capacitor plates; exposing the Si capacitor plates to a **F**-based **gas** mixt. during a high vacuum annealing period, thereby transforming the Si capacitor plates into the hemispherical grained Si capacitor plates; conductively doping the hemispherical grained Si capacitor plates; forming a capacitor dielec. layer adjacent to and coextensive with the hemispherical grained Si capacitor plates; and forming a 2nd conductive Si layer on and coextensive with the capacitor dielec. layer.

IT **7664-39-3, Hydrogen fluoride,** processes
(etching of hemispherical grain silicon capacitor plates by)

RN 7664-39-3 HCA

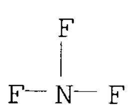
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2, Nitrogen fluoride** (
NF3)
(in **prepn.** of hemispherical grain silicon)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01L021-00

NCL 156662000

CC 76-10 (Electric Phenomena)

ST hemispherical grain silicon prepn; **fluorine** based **gas** hemispherical silicon prepn; vacuum anneal hemispherical silicon prepn

IT Annealing
(prepn. of hemispherical grain silicon using a **fluorine** -based **gas** mixt. and high vacuum anneal)

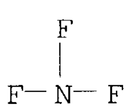
IT **7664-39-3, Hydrogen fluoride,** processes
10035-10-6, Hydrogen bromide, processes
(etching of hemispherical grain silicon capacitor plates by)

IT 75-73-0, Carbon fluoride (CF4) 7440-37-1, Argon, processes
7727-37-9, Nitrogen, processes **7783-54-2, Nitrogen fluoride** (NF3)
(in **prepn.** of hemispherical grain silicon)
IT 7440-21-3, Silicon, processes
(prepn. of hemispherical grain silicon using a **fluorine**-based **gas** mixt. and high vacuum anneal)

L32 ANSWER 9 OF 26 HCA COPYRIGHT 2004 ACS on STN
122:22285 Rare earth magnet with improved corrosion resistance and its manufacture by fluorination. Yano, Koichi; Tokuhara, Hiroki; Kaneko, Juji; Tasaka, Akimasa (Sumitomo Special Metals Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 06244011 A2 **19940902** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-343574 19931215. PRIORITY: JP 1992-358197 19921226.
AB The magnet has a surface part contg. RF3 and/or ROxFy (R = rare earth metals). The magnet is manufd. by fluorination of a rare earth magnet in F or a **F**-contg. **gas** to form RF3 and/or ROxFy and optionally heat treatment at 200-1200.degree.. The magnet showed improved corrosion resistance.
IT **7664-39-3, Hydrogen fluoride**, reactions
7783-54-2, Nitrogen trifluoride
(fluorination agent; **manuf.** of rare earth magnet with good corrosion resistance by surface fluorination)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01F001-053
ICS C22C033-00; C23C008-06; C23C026-00; H01F007-02
CC 77-4 (Magnetic Phenomena)
Section cross-reference(s): 55
IT 75-73-0 **7664-39-3, Hydrogen fluoride**, reactions **7783-54-2, Nitrogen trifluoride**
(fluorination agent; **manuf.** of rare earth magnet with good corrosion resistance by surface fluorination)

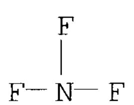
119:150311 Mass and energy analysis of gaseous species in **nitrogen trifluoride** plasma during silicon reactive ion etching. Konuma, M.; Bauser, E. (Max-Planck-Inst. Festkoerperforsch., Stuttgart, 7000/80, Germany). Journal of Applied Physics, 74(1), 62-7 (English) **1993**. CODEN: JAPIAU. ISSN: 0021-8979.

AB The main etching end products are SiF_4 mols. and SiF_3^+ mol. ions. Reactive species that contribute to the etching are at. F radicals and **F_2^+** mol. ions. Most of the pos. ions in the plasma hold NF_2^+ ions and this facilitates etching of neg. biased Si by bombardment. Within a certain range of plasma parameters there are no obvious differences in kinetic energies among the obsd. ions in the plasma. Under a const. **NF_3** pressure of 6.7 Pa, the characteristic mean ion energy of 4 eV at an radio-frequency power of 10 W increases to 20 eV by increasing the radio-frequency power to 90 W.

IT **7783-54-2, Nitrogen trifluoride**
(reactive ion etching of silicon by plasma from, species in)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 76-11 (Electric Phenomena)
Section cross-reference(s): 67

ST **nitrogen fluoride** plasma silicon RIE; reactive ion etching silicon **nitrogen fluoride**

IT Sputtering
(etching, reactive, of silicon with **nitrogen trifluoride**, mechanism of)

IT Kinetics of etching
(sputter, of silicon with **nitrogen trifluoride**)

IT Etching
(sputter, reactive, of silicon with **nitrogen trifluoride**, mechanism of)

IT 7783-61-1P, Silicon fluoride (SiF4) 33687-51-3P, **Nitrogen fluoride** (N2F)(1+) 38192-99-3P, Silicon trifluoride(1+) 62859-94-3P, Silicon tetrafluoride(1+)
(**formation** of, in **nitrogen trifluoride** plasma RIE of silicon)

IT 12381-92-9P, **Hydrogen fluoride**(1+)
13966-04-6P, Diatomic nitrogen(1+), preparation 14158-23-7P, Atomic nitrogen(1+), preparation 14701-13-4P, Atomic fluorine(1+),

preparation 33146-36-0P, Nitrogen monofluoride(1+) 54384-83-7P, **Nitrogen trifluoride**(1+)
(**formation** of, in plasma of **nitrogen trifluoride**)

IT 7732-18-5, Water, reactions
(reactions of, in **nitrogen trifluoride** plasma)

IT **7783-54-2, Nitrogen trifluoride**
(reactive ion etching of silicon by plasma from, species in)

IT 7440-21-3, Silicon, reactions
(reactive ion etching of, in **nitrogen trifluoride** plasma, species in)

L32 ANSWER 11 OF 26 HCA COPYRIGHT 2004 ACS on STN

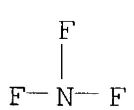
111:242463 Electrochemical reaction of ammonium heptafluorotantalate on carbon in molten fluoride. Tasaka, Akimasa; Isogai, Tomohiro; Omatsu, Hidetoshi; Sako, Nobuyoshi; Yamaya, Satoshi; Watanabe, Morio (Dep. Appl. Chem., Doshisha Univ., Kyoto, 602, Japan). Science and Engineering Review of Doshisha University, 30(2), 140-51 (Japanese) **1989**. CODEN: DDRKAZ. ISSN: 0036-8172.

AB The electrochem. behavior of (NH4)2TaF7(I) in a KF-**HF** melt and in KF-**HF**-NH4F on a glassy C electrode in an undivided cell was investigated. This was a fundamental study for the development of the synthesis of metal fluorides by a 1-step **process** without using **F**, by cyclic voltammetry, potentiostatic measurement and electrolysis, with chromatog. gas anal. and IR spectroscopy. The anodic current just preceding the anodic passivation potential depended on the concn. of I. The soly. of I in KF.2HF at 120.degree. was 0.2 mol.%. The (CF)n anodic film was neither catalytically decompd. by I nor reduced by low-valence complex ions produced at the cathode. The anodic gas contained N, O, **NF3**, CF4, CO2, and N2O. The anodic reaction involved the discharge of F-, fluorination of I and NH4+, and reoxidn. of low-valence complexes formed at the cathode.

IT **7783-54-2P, Nitrogen trifluoride**
(evolution of, in anodic gas from electrochem. reactions of ammonium heptafluorotantalate in fluoride melt on carbon)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 72-5 (Electrochemistry)

IT 75-73-0P, Carbon tetrafluoride 124-38-9P, Carbon dioxide, preparation 7727-37-9P, Nitrogen, preparation 7782-44-7P,

Oxygen, preparation **7783-54-2P, Nitrogen trifluoride** 10024-97-2P, Dinitrogen oxide, preparation
(evolution of, in anodic gas from electrochem. reactions of ammonium heptafluorotantalate in fluoride melt on carbon)

L32 ANSWER 12 OF 26 HCA COPYRIGHT 2004 ACS on STN
109:159327 **Generation** and quenching of **nitrogen fluoride** NF(a) and NF(b) molecules. Setser, D. W.; Cha, H.; Quinones, E.; Du, K. (Dep. Chem., Kansas State Univ., Manhattan, KS, 66506, USA). Journal de Physique, Colloque (C7), C7-343/C7-346 (English) **1987**. CODEN: JPQCAK. ISSN: 0449-1947.

AB The Ar(3P0,2) + NF2 and 2F + HN3 reactions were developed as sources of NF(b1.SIGMA.+) and NF(a1.DELTA.) mols., resp., in a flow reactor. The decay kinetics for these mols. in the presence of added reagent can be studied using std. flow reactor techniques. Room temp. quenching rate consts. for both mols. are reported for several reagents and compared to results for the isoelectronic O2(a) and O2(b) mols.

IT **7664-39-3, Hydrogen fluoride,** properties
7782-41-4, Fluorine, properties
(quenching reconstant of fluoroimidogen by)

RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F—F

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST **nitrogen fluoride prepn** level quenching

IT 67-56-1, Methanol, properties 67-64-1, Acetone, properties 67-66-3, Chloroform, properties 74-82-8, Methane, properties 74-84-0, Ethane, properties 74-85-1, Ethylene, properties 75-50-3, Trimethylamine, properties 75-73-0, Carbon tetrafluoride 124-38-9, Carbon dioxide, properties 334-99-6 630-08-0, Carbon monoxide, properties 666-52-4 1333-74-0, Hydrogen, properties 1455-13-6 **7664-39-3, Hydrogen fluoride**
, properties 7664-41-7, Ammonia, properties 7782-39-0, Deuterium, properties **7782-41-4,** Fluorine, properties 7782-44-7, Oxygen, properties 7790-89-8, Chlorine monofluoride 10024-97-2, Nitrous oxide, properties 10102-43-9, Nitric oxide,

properties
(quenching reconstant of fluoroimidogen by)

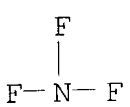
L32 ANSWER 13 OF 26 HCA COPYRIGHT 2004 ACS on STN
106:142805 Manufacture of fluoride glass. Niihori, Osamu; Mimura, Hidenori; Tokiwa, Hideharu; Nakai, Tetsuya (Kokusai Denshin Denwa Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62017024 A2 **19870126** Showa, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-155231 19850716.

AB In the **manuf.** of fluoride glass, **NF3** and/or inert gas is fed into the reactor contg. molten fluoride glass for fluoridation. As the reaction is completed, inert gas is fed into the reactor from an inlet different from the **NF3** inlet to force the reaction product out of the reactor. By this method, removal of the highly reacted **F gas** is carried out in a safe manner, whereas dewatering or deionization treatment can be performed with a small amt. of **HF**.

IT **7783-54-2**
(in **manuf.** of fluoride glass)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C03B008-00
ICS C03C013-04

CC 57-1 (Ceramics)

ST **nitrogen trifluoride** fluoride glass **prodn**; inert gas fluoride glass prodn

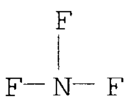
IT Fluoridation
(of fluoride glass, by **nitrogen trifluoride**)

IT **7783-54-2**
(in **manuf.** of fluoride glass)

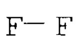
L32 ANSWER 14 OF 26 HCA COPYRIGHT 2004 ACS on STN
105:53425 Tetrafluoroammonium salts. Christe, Karl O.; Wilson, William W.; Schack, Carl J.; Wilson, Richard D. (Rocketdyne Div., Rockwell Int. Corp., Canoga Park, CA, 91304, USA). Inorganic Syntheses, 24, 39-48 (English) **1986**. CODEN: INSYA3. ISSN: 0073-8077.

AB **NF3, F2,** and SbF3 react at 250.degree. and 70 atm. to give [NF4][SbF6], which reacts with Cs2[MnF6] and CsF in **HF** at -78.degree. to give [NF4]2[MnF6] and [NF4][HF2], resp. **NF3, F2,** and BF3 undergo UV-photolysis at -196.degree. to give [NF4][BF4]. [NF4][HF2] reacts with SiF4 and WOF4 to give [NF4]2[SiF6] and [NF4][WOF5], resp.

IT **7783-54-2**
(reactions of, with fluorine and boron trifluoride or antimony trifluoride, tetrafluoroammonium salts by)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, reactions
(reactions of, with **nitrogen trifluoride** and boron trifluoride or antimony trifluoride, tetrafluoroammonium salts by)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



CC 78-5 (Inorganic Chemicals and Reactions)
IT 16871-76-4P
(**prepn.** from **nitrogen trifluoride** and fluorine and antimony trifluoride and reactions of, with cesium fluoride and cesium hexafluoromanganate)
IT 15640-93-4P
(prepn. of, from boron trifluoride and fluorine and **nitrogen trifluoride**)
IT 79028-46-9P
(prepn. of, from tetrafluoroammonium hydrogen difluoride and tungsten tetrafluoride oxide in liq. **hydrogen fluoride**)
IT 7783-56-4
(reaction of, with fluorine and **nitrogen trifluoride**, tetrafluoroammonium hexafluoroantimonate by)
IT 7637-07-2, reactions
(reaction of, with **nitrogen trifluoride** and fluorine, tetrafluoroammonium tetrafluoroborate by)
IT 16962-46-2
(reaction of, with tetrafluoroammonium hexafluoroantimonate in liq. **hydrogen fluoride**, tetrafluoroammonium hexafluoromanganate by)
IT 13520-79-1
(reaction of, with tetrafluoroammonium hydrogen difluoride in liq. **hydrogen fluoride**, tetrafluoroammonium pentafluorooxotungstate by)
IT **7783-54-2**

(reactions of, with fluorine and boron trifluoride or antimony trifluoride, tetrafluoroammonium salts by)

IT **7782-41-4**, reactions
(reactions of, with **nitrogen trifluoride** and boron trifluoride or antimony trifluoride, tetrafluoroammonium salts by)

L32 ANSWER 15 OF 26 HCA COPYRIGHT 2004 ACS on STN

101:81575 Perfluoroammonium xenon fluoride. Christe, Karl O.; Wilson, William W. (United States Dept. of the Navy, USA). U.S. US 4447407 A **19840508**, 3 pp. Division of U.S. 4,428,913. (English). CODEN: USXXAM. APPLICATION: US 1983-540951 19831011. PRIORITY: US 1983-391786 19830624.

AB Photochem. prepn. is described of perfluoroammonium xenon fluoride compds. The compd. (NF4)2XeF8 which provides the highest **NF3-F2** yield and gives the highest theor. detonation pressures in explosive formulations is prepd. by photolysis of NF4XeF7 salt with blue 4880 .ANG. light of Ar ion laser.

IT **7664-39-3**, properties
(in prepn. of tetafluoroammonium fluoroxenon salt)

RN 7664-39-3 HCA

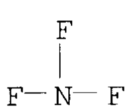
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2**
(in **prepn.** of tetrafluoroammonium fluoroxenon salt)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC C01B023-00

NCL 423262000

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 50

IT **7664-39-3**, properties
(in prepn. of tetafluoroammonium fluoroxenon salt)

IT **7783-54-2**
(in **prepn.** of tetrafluoroammonium fluoroxenon salt)

IT 16871-76-4
(reaction with **hydrogen fluoride**)

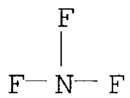
L32 ANSWER 16 OF 26 HCA COPYRIGHT 2004 ACS on STN
101:32376 Coordinatively saturated fluoro cations. Oxidative fluorination reactions with fluorokrypton(1+) salts and platinum hexafluoride (PtF6). Christe, Karl O.; Wilson, William W.; Wilson, Richard D. (Rocketdyne, Rockwell Int., Canoga Park, CA, 91304, USA). Inorganic Chemistry, 23(14), 2058-63 (English) **1984**. CODEN: INOCAJ. ISSN: 0020-1669.

AB The usefulness of KrF+ salts and PtF6 as oxidative fluorinators for the prepn. of the coordinatively satd. complex fluoro cations NF4+, ClF6+, and BrF6+ was studied. The prepn. of NF4SbF6, NF4AsF6, NF4BF4, and NF4TiF5.nTiF4 from KrF2-Lewis acid adducts and **NF3** were studied under different reaction conditions. The fluorination of **NF3** by KrF[SbF6] in **HF** soln. proceeded quant. at .gtoreq.-31.degree., indicating an ionic 2-electron oxidn. mechanism. An improved prepn. of KrF[MF6] (M = As, Sb), Raman data and solubilities in **HF**, and the existence of a Kr2F3+.nKrF2BF4- adduct in **HF** at -40.degree. are reported. Attempts to fluorinate OF2, CF3NF2, and ClF4O- with KrF+ salts were unsuccessful. Whereas KrF+ is capable of oxidizing **NF3**, ClF5, and BrF5 to the corresponding complex fluoro cations, PtF6 is capable of oxidizing only **NF3** and ClF5. Since the yield and purity of the NF4+ fluoroplatinate salts obtained in this manner was low, NF4PtF6 was also **prepd.** from **NF3**, **F2**, and PtF6 at elevated temp. and pressure. General aspects of the formation mechanisms of coordinatively satd. complex fluoro cations are discussed briefly.

IT **7782-41-4**, reactions
(reaction of, with platinum hexafluoride and **nitrogen trifluoride**)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

IT **7783-54-2**
(reactions of, with krypton difluoride and arsenic pentafluoride or boron trifluoride or with platinum hexafluoride in hydrofluoric acid or fluorokrypton hexafluoroantimonate in hydrofluoric acid)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 78-9 (Inorganic Chemicals and Reactions)
ST fluorination agent fluorokrypton platinum fluoride; **nitrogen fluoride** fluorination; halogen fluoride fluorination; krypton fluoride cation fluorination agent
IT 52708-44-8P
(prepn. from antimony pentafluoride, **hydrogen fluoride** and krypton difluoride and reaction with **nitrogen trifluoride** in solid state or **hydrogen fluoride** soln.)
IT 16871-75-3P
(prepn. of, from arsenic pentafluoride, krypton difluoride and **nitrogen trifluoride**)
IT 15640-93-4P
(prepn. of, from boron trifluoride, krypton difluoride and **nitrogen trifluoride**)
IT 58702-89-9P
(prepn. of, from fluorokrypton hexafluoroantimonate and **nitrogen trifluoride** and hydrofluoric acid)
IT 7440-06-4DP, fluoro complexes, tetrafluoroammonium salts 30494-78-1DP, fluoroplatinate salts 90025-87-9P
(prepn. of, from **nitrogen trifluoride** and platinum hexafluoride in hydrofluoric acid)
IT 13693-05-5
(reaction of, with chlorine pentafluoride or **nitrogen trifluoride** in hydrofluoric acid)
IT 7783-70-2
(reaction of, with krypton difluoride and boron trifluoride, **hydrogen fluoride** or **nitrogen trifluoride**)
IT 7637-07-2, reactions
(reaction of, with krypton difluoride and **nitrogen trifluoride**)
IT 7784-36-3
(reaction of, with **nitrogen trifluoride** and krypton difluoride)
IT **7782-41-4**, reactions
(reaction of, with platinum hexafluoride and **nitrogen trifluoride**)
IT **7783-54-2**
(reactions of, with krypton difluoride and arsenic pentafluoride or boron trifluoride or with platinum hexafluoride in hydrofluoric acid or fluorokrypton hexafluoroantimonate in

hydrofluoric acid)

L32 ANSWER 17 OF 26 HCA COPYRIGHT 2004 ACS on STN
93:222648 **Manufacture** of **nitrogen trifluoride.** (Air Products and Chemicals, Inc., USA). Jpn. Tokkyo Koho JP 55008926 B4 **19800306** Showa, 7 pp. (Japanese). CODEN: JAXXAD. APPLICATION: JP 1978-44116 19780414.
AB **Gaseous F** is reacted with NH4F.**HF** preheated to a temp. higher than its m.p. but <204.4.degree.. Thus, 60.8 kg NH4F.**HF** was charged into a reactor, heated to 126.6.degree., and reacted with 1.415 m3 F for 9 h. The **NF3** yield was 31%.
IT **7783-54-2P**
(**manuf.** of)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

```
   F
   |
F— N— F
```

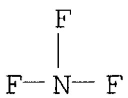
IT **7782-41-4,** reactions
(reaction of, with ammonium fluoride)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

```
F— F
```

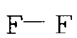
IC C01B021-083
CC 49-8 (Industrial Inorganic Chemicals)
ST **nitrogen trifluoride manuf;** ammonium fluoride fluorination
IT **7783-54-2P**
(**manuf.** of)
IT **7782-41-4,** reactions
(reaction of, with ammonium fluoride)

L32 ANSWER 18 OF 26 HCA COPYRIGHT 2004 ACS on STN
89:91827 **Nitrogen trifluoride.** Woytek, Andrew Joseph; Lileck, John Theodore (Air Products and Chemicals, Inc., USA). U.S. US 4091081 **19780523,** 6 pp. (English). CODEN: USXXAM. APPLICATION: US 1977-788724 19770419.
AB **NF3** is **manufd.** by reacting F with molten NH4HF2 at .ltoreq.400.degree.F. NH3 is also injected into the molten NH4HF2 simultaneously with the F to maintain the molar ratio of byproduct **HF** to NH3 at 2.0-2.5:1.

IT **7783-54-2P**
(**manuf.** of)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **7782-41-4**, reactions
(reaction of, with ammonium difluoride)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

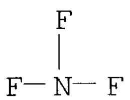


IC C01B021-52
NCL 423406000
CC 49-8 (Industrial Inorganic Chemicals)
ST **nitrogen fluoride manuf;** ammonium fluoride fluorination
IT **7783-54-2P**
(**manuf.** of)
IT **7782-41-4**, reactions
(reaction of, with ammonium difluoride)

L32 ANSWER 19 OF 26 HCA
78:86670 Perfluoroammonium cation-containing ionic salts. Tolberg, Wesley E.; Stringham, Roger S.; Rewick, Robert T. (Stanford Research Institute). U.S. US 3708570 **19730102**, 4 pp. (English). CODEN: USXXAM. APPLICATION: US 1967-614524 19670130.
AB Solid ionic salts, e.g. NF4SbF6, having the highly energetic NF4+, are produced by the reaction of **NF3**(g), F(g), and SbF5(l) (in the presence or absence of **HF**) at 100-200.degree. and 50-200 atm. Use of AsF5, PF5, or BiF3 gives very stable, powerful fluorinating agents and useful oxidants. For example, **NF3**, **F2** and SbF5 dissolved in liq. **HF** reacted at .apprx.200.degree. and 1800 psi for 124 hr to yield 99.5% pure NF4SbF6 and consume .apprx.60% of the **NF3**, all the SbF5, and almost all of the F. All the **HF** was recovered. Somewhat more than 60% of the **NF3** initially present was converted to a solid, gray-brown product. Almost all of the F and all of the SbF5 were consumed, whereas the **HF** was recovered quant.
IT **7782-41-4**, reactions
(in manuf., of perfluoroammonium salts)

RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

IT **7783-54-2**
(reaction of, in **manuf.** of perfluoroammonium salts)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



IC C01B
NCL 423301000
CC 49-5 (Industrial Inorganic Chemicals)
IT **7782-41-4**, reactions
(in manuf., of perfluoroammonium salts)
IT 16871-76-4P
(manuf. of, from antimony pentafluoride and fluorine and **nitrogen fluoride**)
IT 16871-75-3P
(manuf. of, from arsenic hexafluoride and fluorine and **nitrogen fluoride**)
IT **7783-54-2**
(reaction of, in **manuf.** of perfluoroammonium salts)

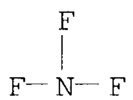
72:27708 **Nitrogen trifluoride formation** by the potentiostatic method. Watanabe, Nobuatsu; Tasaka, Akimasa; Nakanishi, Koichiro (Kyoto Univ., Kyoto, Japan). Denki Kagaku oyobi Kogyo Butsuri Kagaku, 37(7), 481-5 (Japanese) **1969**. CODEN: DKOKAZ. ISSN: 0366-9297.
AB The **formation** of **NF3** by the electrolysis of fused KF-**HF**-NH4F at 130.degree. was studied by the potentiostatic method. The current efficiencies for anode **products** (N2, **NF3**, **F2**, and N2O) depended on the anode potential, anode c.d., and concn. of NH4F. When the concn. of NH4F was increased, the threshold potentials for **NF3** and **F2 production** were shifted to the pos. side. The proposed mechanism of this system was that the free radical of F was formed on the (CF)n-I film, and NH4+ was fluorinated by it. The merit of this process was as follows. By the addn. of KF the vapor pressure of NH4F and **HF** was reduced, and the elec. cond. was increased, resulting in the

lowering of the potential with for the **generation** of **NF3**. The contamination of anode gas with **F2** was avoided by the increase of concn. of NH4F.

IT **7783-54-2P**
(**prepn**. of, by electrolysis of fused ammonium fluoride-potassium fluoride in anhydrous hydrofluoric acid)

RN 7783-54-2 HCA

CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 77 (Electrochemistry)

ST **nitrogen trifluoride prepn**;
trifluoride N electrochem method; electrolysis fluorides K H ammonium; fluorides K H ammonium electrolysis

IT **7783-54-2P**
(**prepn**. of, by electrolysis of fused ammonium fluoride-potassium fluoride in anhydrous hydrofluoric acid)

L32 ANSWER 21 OF 26 HCA COPYRIGHT 2004 ACS on STN

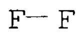
70:100370 Determination of the standard enthalpy of **formation** of **nitrogen trifluoride**. Zercheninov, A. N.; Chesnokov, V. I.; Pankratov, A. V. (USSR). Zhurnal Fizicheskoi Khimii, 43(2), 390-3 (Russian) **1969**. CODEN: ZFKHA9. ISSN: 0044-4537.

AB A method is described for thermal investigation of the reaction of gaseous **N fluoride** compds. with H2 in a Pt lined calorimetric bomb. The heat of reaction **NF3**(g) + 1.5H2(g) .fwdarw. 3HF(soln.) + 0.5N2(g) was calcd. to be -205.38 + 0.77 kcal./mole, side reactions caused by N2O and O2 impurities and formation of HNO3, NH3 and CuF2 being considered. By use of this figure and published data on the enthalpy of **HF** in soln., standard heat of **formation** of **NF3** is calcd. as -31.57 kcal./ mole. Dissocn. energies for the 3 N-F bonds in **NF3** were calcd. by using the heat of **formation** of **NF3** and published data on heat of formation of at. N and F: E298(**F3N**-F) = 61.1 kcal./mole, E298(FN-F) = E298(F-N) = 70.6 4 kcal./mole. Heat of formation of the NF radical was calcd. as 61.4 .+-. 2.1 kcal./mole.

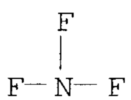
IT **7782-41-4**, properties
(bonds of, with nitrogen)

RN 7782-41-4 HCA

CN Fluorine (8CI, 9CI) (CA INDEX NAME)



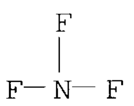
IT **7783-54-2**
(heat of **formation** of)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 69 (Thermodynamics, Thermochemistry, and Thermal Properties)
ST **nitrogen fluorides**; enthalpy formation;
formation enthalpy; nitrogen F bonds thermodns; fluorine N bonds thermodns
IT Heat of reaction
(of hydrogen, with **nitrogen fluoride**)
IT Heat of **formation**
(of **nitrogen fluoride**)
IT **7782-41-4**, properties
(bonds of, with nitrogen)
IT **7783-54-2** 13967-06-1
(heat of **formation** of)
IT 1333-74-0, properties
(heat of reaction of, with **nitrogen fluoride**)

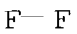
L32 ANSWER 22 OF 26 HCA COPYRIGHT 2004 ACS on STN
66:97012 **Production** of **nitrogen fluorides**.
Fullam, Harold T.; Seklemian, Haig V. (Stauffer Chemical Co.). U.S. US 3304248 **19670214**, 3 pp. (English). CODEN: USXXAM.
APPLICATION: US 19630724.
AB **NF3** and N2F4 are **prepd.** in an easily separable form contacting elemental F with a N plasma. Thus, a water-cooled Cu reactor, 18-in. long, is fitted with a W cathode and anode. A plasma arc is operated at 40 v. d. c. and 300 amp. to obtain .apprx.8000.degree.. High-purity N2 is fed into the arc at 0.5 standard ft.3/min. and then is passed through the hollow anode into the reactor chamber. **F2**, scrubbed free of **HF** by passage through a NaF bed, is fed to the arc chamber at the same rate. The resultant gas stream is at .apprx.3500.degree.; immediate quenching is achieved with liquid N2. By varying the ratio of N2: **F2**, **NF3** can be **produced** to the exclusion of N2F4.
IT **7783-54-2P**
(**manuf.** of, from fluorine and nitrogen plasma)

RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

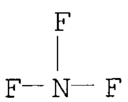


NCL 204178000
CC 49 (Industrial Inorganic Chemicals)
ST **NITROGEN FLUORIDES**; FLUORIDES N; FLUORINATION
COMPD; OXIDIZER PROPELLANTS
IT Electric plasma
(of nitrogen, **nitrogen fluoride manuf**
. in)
IT 7727-37-9, properties
(elec. plasma, **nitrogen fluoride** (**NF3**
and N2F4) **manuf.** in)
IT **7783-54-2P** 10036-47-2P
(**manuf.** of, from fluorine and nitrogen plasma)

L32 ANSWER 23 OF 26 HCA
66:25306 Electrode kinetics of anodic **nitrogen trifluoride** evolution reaction. Watanabe, Nobuatsu; Ishigaki, Isao; Yoshizawa, Shiro (Univ. Kyoto, Kyoto, Japan). Journal of the Electrochemical Society of Japan, 34(2), 77-85 (English) **1966**. CODEN: JEJOAC. ISSN: 0013-4678.
AB The anodic **production** of **NF3** was investigated on 5 kinds of C and Pt anodes from molten KF-**HF**-NH4F baths. Studied were the rate of buildup of overvoltage at const. current, the rate of decay of overvoltage on cutting the current off, the c.d.-overvoltage relation, and the compn. of the gases generated. In the c.d. range 10-4 to 10-2 amp./cm.2, the anode gas consisted mainly of **NF3** with small amts. of NO and mol. F. The percentage of these contaminents increased at higher c.ds. The polarized **NF3** electrode is a mixed electrode, and **NF3** evolution seems to have activation control under certain conditions and diffusion control under others. The rate detg. step on the C electrode, when the process is activation controlled, is NH3.**HF** + C.F = NH2F + **HF** + H+ + C + e-, where C.F represents at. F adsorbed on the C electrode. The b values of the Tafel equations are 0.3 on Pt and 0.7 v. on C.
IT **7782-41-4P**, preparation
(at carbon or platinum anodes in fused fluoride baths)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)



IT **7783-54-2P**
    (**formation** of, on carbon or platinum anodes in fused
    fluoride baths)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)

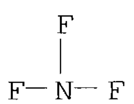


CC 77 (Electrochemistry)
ST KINETICS ELECTRODE **N TRIFLUORIDE**
IT Overvoltage
    (on carbon or platinum anodes in fused fluoride baths,
    formation of **nitrogen fluoride** in
    relation to)
IT **7782-41-4P**, preparation 10102-43-9P, preparation
    (at carbon or platinum anodes in fused fluoride baths)
IT **7783-54-2P**
    (**formation** of, on carbon or platinum anodes in fused
    fluoride baths)

L32 ANSWER 24 OF 26 HCA COPYRIGHT 2004 ACS on STN
63:1601 Original Reference No. 63:250d-f Preparation of fluorine and its compounds. X. Electrode kinetics of the **formation** of **nitrogen trifluoride**. Watanabe, Nobuatsu; Ishigaki, Isao; Yoshizawa, Shiro (Univ. Kyoto, Japan). Denki Kagaku, 32(9), 674-9 (Japanese) **1964**. CODEN: DNKKA2. ISSN: 0366-9440.
AB cf. ibid. 31, 698-700, 756-61(1963); CA 62, 11424f. In the electrolysis of KF + **HF**.NH4F at a const. current, the cathode was C (10 sq. cm.) and the anode was C, graphite, or Pt (2 sq. cm.). The gas produced at the anode was mainly **NF3** and a small amt. of NO (by ir analysis) and **F2** (by gas chromatography) at a c.d. of 10-4-10-2 amp./sq. cm. The decompn. potential E vs. H electrode, at which the anode potential vs. c.d. curve deviated from a straight line, decreased linearly with the concn. of NH4F below .fwdarw.0.1 mole % but decayed rapidly beyond this concn. Thus, E was not strictly the equil. potential of a single reaction. The Tafel equation applies to the relation between the anode c.d. and its overvoltage. After the electrolysis current had been turned off, the change of the overvoltage varied linearly with the log of the time. The slope and intercept gave b and i0

(exchange c.d.) values in agreement with those derived from the Tafel plot. The anode processes were inferred to be of the following sequence: C + F- .fwdarw. C.F + e, NH3.**HF** + C.F .fwdarw. NH2F + **HF** + H+ + C + e, NH2F + C.F .fwdarw. NHF2 + H+ + C + e, NHF2 + C.F .fwdarw. **NF3** + H+ + C + e, NH2F + NHF2 .fwdarw. **NF3** + NH3, NH3 + **HF** .fwdarw. NH3. **HF**, C.F + F- .fwdarw. C + **F2** + e, and C.F + F- .fwdarw. **F2** + C + e, where C is the carbon electrode and C.F stands for an F atom adsorbed on C.

IT **7783-54-2, Nitrogen fluoride, NF3**
(**formation** of, reaction kinetics at anodes in)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 15 (Electrochemistry)
IT Overvoltage
(in **nitrogen fluoride** (**NF3**) **formation**)
IT Reaction kinetics and(or) Velocity
(in **nitrogen fluoride** (**NF3**) **formation** at anodes)
IT Anodes and(or) Positive electrodes
(reactions, kinetics of, in **NF3 formation**)
IT **7783-54-2, Nitrogen fluoride, NF3**
(**formation** of, reaction kinetics at anodes in)

L32 ANSWER 25 OF 26 HCA COPYRIGHT 2004 ACS on STN
49:72922 Original Reference No. 49:13809c-d Fluorination of boron nitride. Glemser, Oskar; Haeseler, Harke (Univ. Gottingen, Germany). Z. anorg. u. allgem. Chem., 279, 141-5 (Unavailable) **1955**.
AB BN reacts quantitatively with liquid **HF** in the presence of a little H2O to form NH4BF4, identified by analysis and comparison of its x-ray powder diagram with that of KBF4. F reacts quantitatively with BN in an exothermic, chemiluminescent reaction to form BF3 and N2. There is no evidence for the **formation** of **NF3**. With AgF2 as the fluorinating agent, the products are also BF3 and N2, but the reaction is not quant.
IT **7664-39-3**, Hydrofluoric acid
(reaction with BN)
RN 7664-39-3 HCA

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7782-41-4**, Fluorine
(reactions with BN)
RN 7782-41-4 HCA
CN Fluorine (8CI, 9CI) (CA INDEX NAME)

F— F

CC 6 (Inorganic Chemistry)
IT Ammonium fluoborate, NH4BF4
(formation from **HF** and BN)
IT **7664-39-3**, Hydrofluoric acid
(reaction with BN)
IT **7782-41-4**, Fluorine
(reactions with BN)

23:43433 Original Reference No. 23:5014a-d High-temperature technic and new fluorides. Ruff, O. Angewandte Chemie, 42, 807-10 (Unavailable) **1929**. CODEN: ANCEAD. ISSN: 0044-8249.

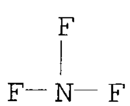
AB Vapor pressure diagrams of Fe, Co and Ni are shown, based on actual detns. in C-tube furnaces improved by the use of double, water-cooled walls. The many reactions of the refractory oxides with W and other low-volatility metals, e. g., W + 3 CaO = WO3 + 3 Ca, caused renewed interest in this field. X-ray analysis was used. The main cause of cracks in pure zircon vessels above 1000.degree. was found to be reversible conversion of monoclinic ZrO2 to the more dense, tetragonal form, which could be avoided by adding foreign oxides, such as MgO, to form a cubic lattice at 1700.degree., which is stable to sharp temp. changes. X-ray diagrams of the system ZrO2-CaO are shown. Heating chambers for 3000.degree. have been built. **NF3** was **made** by electrolysis of (NH4)HF2; No2F from NO2 and **F2**. NO2F b. -70.degree. instead of -63.degree. given in the literature. Liquid and gaseous **NF3** is colorless, slightly sol. in H2O, inert to NaOH solns., and its mixts. with H2 and NH3 explode violently. **NF3** and H2O vapor is not dangerous, and on ignition forms N2O3, **HF** and a white ppt. of SiO2. Mixts. of Cl and F are explosive but can burn through a nozzle with a yellow flame; app. of Cu are used instead of glass because 4ClF + SiO2 = 2Cl2O + SiF4. The heat of formation of ClF is +22 cal.; that of **HF** by calcn. +64.8 .+-. 1 cal. ClF ignites cotton instantly and burns Al more rapidly than does F. In addn. to RhF3 there is RhF4 or RhF5.

Black PdF3 takes fire in H2. Light brown CoF3 gives up 1 F atom readily to most substances, e. g., warming a mixt. of CoF3 and Si causes the mass to glow, and is therefore useful in preparative chemistry.

IT **7664-39-3**, Hydrofluoric acid
(heat of formation of)
RN 7664-39-3 HCA
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT **7783-54-2, Nitrogen fluoride,**
NF3
(**prepn.** of)
RN 7783-54-2 HCA
CN Nitrogen fluoride (NF3) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 18 (Acids, Alkalies, Salts, and Sundries)
IT Heat of formation
(of chlorine fluoride and **HF**)
IT **7664-39-3**, Hydrofluoric acid
(heat of formation of)
IT **7783-54-2, Nitrogen fluoride,**
NF3 10022-50-1, Nitryl fluoride 10026-18-3, Cobalt fluoride, CoF3 144228-59-1, Rhodium fluoride
(**prepn.** of)

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L33 ANSWER 1 OF 6 HCA COPYRIGHT 2004 ACS on STN
96:173234 Perfluoroammonium salts of metal heptafluoride anions. Wilson, William W.; Christe, Karl O. (Rockwell Int. Corp., Canoga Park, CA, 91304, USA). Inorganic Chemistry, 21(5), 2091-4 (English) **1982**. CODEN: INOCAJ. ISSN: 0020-1669.
AB NF4XF7 (X = W, U) were prepd. by allowing XF6 to react with NF4HF2.nHF. The purity of the NF4XF7 salts prepd. in this manner was .apprx.98 wt.% with CsSbF6 and NF4SbF6 as the principal impurities. The NF4XF7 are cryst., hygroscopic solids that are stable in a dynamic vacuum at 125.degree.. At higher temps. both salts decomp. for **form NF3, F2,** and XF6.

CC 78-5 (Inorganic Chemicals and Reactions)
IT 16871-76-4
(reaction of, with cesium fluoride and **hydrogen fluoride**)

L33 ANSWER 2 OF 6 HCA COPYRIGHT 2004 ACS on STN
96:8940 Stable tetrafluoroammonium salt of high fluorine content. Christie, Karl O.; Wilson, William W. (United States Dept. of the Army, USA). U. S. Pat. Appl. US 219056 A0 **19810731**, 10 pp. Avail. NTIS Order No. PAT-APPL-219 056 (English). CODEN: XAXXAV. APPLICATION: US 1980-219056 19801222.
AB The prepn. and properties of (NF4)2MnF6 are described for use as solid propellants **generating NF3-F2** gases and explosives with high detonation pressures. (NF4)2MnF6 has a high oxidizer content and good thermal stability. It is prepd. from NF4SbF6 37.29 and Cs2MnF6 18.53 mmol in N2 by treating in 20 mL liq. **HF** at -78.degree., warming to 25.degree. for 30 min, and recooling.
CC 50-1 (Propellants and Explosives)
Section cross-reference(s): 49

L33 ANSWER 3 OF 6 HCA COPYRIGHT 2004 ACS on STN
94:113664 Research studies in nitrogen tetrafluoride(+)salts. Christe, K. O. (Rocketdyne Div., Rockwell Int., Canoga Park, CA, USA). Report, ARO-14394.10-C, RI/RD80-157; Order No. AD-A086981, 124 pp. Avail. NTIS From: Gov. Rep. Announce. Index (U. S.) 1980, 80(23), 4926 (English) **1980**.
AB The results are described of a 3-yr program in basic research studies in NF4+ chem. The mechanism of NF4+ salt formation and decompn. was detd. and the decompn. kinetics of NF4AsF6 and NF4BF4 were measured. The **formation** of **NF3**+ salt intermediates, both in the formation and decompn. of NF4+ salts, was established, and the **NF3**+ radical cation was thoroughly characterized by ESR spectroscopy. Improved synthetic methods were developed for NF4SbF6 and its metathesis to other NF4+ salts. A new method was developed for the synthesis of NF4+ salts derived from polymeric Lewis acids which do not form **HF**-sol. Cs salts. The following new NF4+ salts were synthesized and thoroughly characterized: (NF4)2MnF6, NF4HF2, NF4UF5O, NF4ClO4 and NF4SO3F. In addn., the novel N2F3SnF5 and N2F3SbF6 salts, which are useful burning-rate modifiers in solid propellant **NF3-F2** gas **generator** formulations, were prepd. and characterized.
CC 78-8 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 67
IT Propellants
(fluorine-**nitrogen trifluoride**, trifluorodiazenium salts as burning modifiers for)

L33 ANSWER 4 OF 6 HCA COPYRIGHT 2004 ACS on STN
92:8439 Displacement reaction for producing NF4PF6. Christe, Karl O.; Schack, Carl J. (Rockwell International Corp., USA). U.S. US 4172881 **19791030**, 3 pp. (English). CODEN: USXXAM. APPLICATION: US 1977-849377 19771107.
AB NH4PF6, for use as a solid propellant in **NF3-F2 generators** for use in chem. **HF**-DF lasers, is synthesized by mixing PF5 with NH4BF4 at >-196 and warming it to .ltoreq.25.degree. to cause reaction and removal of excess PF5 and BF3. Thus, NF4BF4 was combined at -196.degree. with a 20-fold excess of PF5 in a stainless-steel cylinder and the mixt. held at 25.degree. for 64 h. The volatile components were BF3 and PF5 and the cryst. residue was NF4PF6 contg. no detectable amt. of NF4BF4. X-ray powder diffraction data are given for the tetragonal (a 7.577 and c 5.653.ANG.) crystals. Also, IR and Raman spectral data are tabulated.
IC C01B025-10
NCL 423301000
CC 49-8 (Industrial Inorganic Chemicals)

L33 ANSWER 5 OF 6 HCA COPYRIGHT 2004 ACS on STN
91:195401 Inorganic halogen oxidizer research. Christe, K. O. (Rocketdyne Div., Rockwell Int., Canoga Park, CA, USA). Report, RI/RD79-165; Order No. AD-A066149, 665 pp. Avail. NTIS From: Gov. Rep. Announce. Index (U. S.) 1979, 79(16), 189 (English) **1979**.
AB A basic research program in the area of inorg. halogen oxidizers resulted in 91 papers published in major tech. journals, 23 papers presented at international and national meetings, and 14 issued and 4 pending U.S. patents. Major efforts included studies in the areas of **N fluorides**, halogen fluorides and oxyfluorides, perchlorates, novel onium salts, and S fluorides. In the area of **N fluorides**, the most significant breakthrough was achieved in NF4+ salts and synthetic methods developed under this program resulted in NF4+ based solid propellant **NF3-F2** gas **generators** for chem. **HF**-DF lasers.
CC 50-2 (Propellants and Explosives)
ST rocket halide oxidizer; **nitrogen fluoride** rocket oxidizer

L33 ANSWER 6 OF 6 HCA COPYRIGHT 2004 ACS on STN
86:149828 Synthesis and characterization of bis(tetrafluoroammonium) hexafluorostannate and tetrafluoroammonium pentafluorostannate. Christe, Karl O.; Schack, Carl J.; Wilson, Richard D. (Rocketdyne, Div., Rockwell Int., Canoga Park, CA, USA). Inorganic Chemistry, 16(4), 849-54 (English) **1977**. CODEN: INOCAJ. ISSN: 0020-1669.

AB (NF4)2SnF6 was prepd. by metathesis between Cs2SnF6 and NF4SbF6 in **HF** soln. It is a white solid, stable to >200.degree.. Based on its x-ray powder data, it crystallizes in the tetragonal system and is isotypic with (NF4)2GeF6. Its compn. was established by elemental anal. and the presence of tetrahedral NF4+ and octahedral SnF62- ions in the solid state and in BrF5 soln. was demonstrated by vibrational and 19F NMR spectroscopy, resp. The salt NF4SnF5 was obtained in quant. yield from the displacement reaction between equimolar amts. of NF4BF4 and SnF4 in **HF** soln. When a large excess of NF4BF4 was used, the main product was again NF4SnF5 and only a small amt. of (NF4)2SnF6 was formed. The NF4SnF5 salt was characterized by elemental anal., vibrational and 19F NMR spectroscopy, and x-ray powder data. The vibrational spectra of the solid and the 19F NMR spectra of BrF5 solns. show that SnF5- possesses a polymeric structure of cis-F-bridged SnF6 octahedra, analogous to that obsd. for GeF5- in NF4GeF5. The potential of (NF4)2SnF6 for a "self-clinkering" **NF3-F2** gas **generator** is briefly discussed.

CC 78-7 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75